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The Dynamics of Education

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The Dynamics of Education

A Methodology of Progressive Educational Thought

BY

HILDA TABA, Ph.D.

With an Introduction by

WILLIAM HEARD KILPATRICK

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TO
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FOREWORD

This book is an effort to present both the meaning and process of education in a new and truer light. The word dynamics in the title will perhaps suggest the point of view. The author's chief emphasis is upon the conception of becoming. In fact, the term becoming might well have been used in making up the title of the book, so definitely and precisely is the author's effort that of applying this conception to the study of human experience in general and of education in particular.

The analyses as herein made are but the latest in a long developing line of attempts to deal with that ever crucial issue, the fact of change. The author's specific purpose, however, is to offer the fact of becoming as an alternative and corrective to the atomism all too pervasive in current scientific efforts at treating human phenomena. Too slavishly have psychology and the social sciences followed the methods devised by the exact sciences for dealing with physical problems. In the degree that we grant success to the author's effort, in like degree may education hope to profit from the more fitting methodology thus made available.

Many indeed have been the efforts to deal with the fact of change. That times do shift and new things succeed the old has of course been remarked time out of mind. But mere shift, mere succession, could never satisfy. With such neither the thinking mind nor the controlling hand could deal. The abiding and recurrent were thus early exalted. With Plato and others, number and the even moving stars were taken as pointing to the unvarying highest good. Aristotle advanced the conception of biologic growth in which a change bounded in scope and

limited in time seemed to show itself obedient to timeless form and species. Thus, it appeared, could lawless change be tamed, and dogma and status made safe—a conception and programme which feudal society and church were only too glad to accept. Modern science also began its conquering career along similar lines. For it, amid apparent shift and succession there ruled eternal laws fixed from all time. Granted but knowledge of what now is, then could the whole future be foretold. In this manner were determined in advance " the fixed events of fate's remote decrees." Apparent novelty was thus in fact but human ignorance. Becoming was unfolding and no more.

But a new temper arose. Man found faith in himself and dared to dream of a progressive improvement of human society which man by his efforts would bring. Human institutions should yield to human will. In building this new conception of progress science helped. Geology showed for the earth itself a history in which secular development was clearly evident to view. Meanwhile, the study of human history also became genetic. And the great Darwin gave impetus to the changing view. In evolution, becoming was increasingly conceived as determined not antecedently, but in and through the current action of factors resident within the system under consideration. From the same biologic original not only could diverse results arise, but in every case the future history seemed not as yet determined. Moreover, in individual development, ontogeny, it has appeared in our day that the outcome is determined not in advance, that even here the process is also conditioned as it goes. Becoming is increasingly accepted as no longer mere unfolding.

The older views, of course, hung on and still do in many ways. Some have thought of evolution as merely a grander mode of effecting the eternal will and purpose fixed from before the beginning of time. For these,

becoming still remains somehow antecedently or at least externally determined. A more scholarly group would maintain the aristocratic tradition, and hold to the essential timeless character of Reality. For these, the process which we see is of appearance only. Those who thus hold seem most to fear for the values lest they find no firmer other basis than the exigencies of human experience. At any cost man must be controlled. For all such, becoming, being essentially timeless, both is and is not what it seems to be.

For our author, however, becoming is what it is, an obvious fact of human experience. Look where we will, at the large or at the small, our world is constantly in the process of becoming. And the process is one of continuous and cumulative change, alike observable both in the subject and in the object pole of relation as well as in the relation itself. The proper if not the only way of approaching this fact of becoming is through the human act. Any particular single behaviour act is to be regarded not as a result of some permanent quality or condition but rather as a passing moment in the sequence of changing processes and inter-relations of processes. Each such act is thus determined partly by the preceding acts, partly by the structure of the various processes, effective at the moment, and partly by that organized directing which may properly be called purposiveness, though this need not in any strict sense be either teleological or conscious. Such is the conception of becoming which we are herein asked to study.

At the outset, reference was made to scientific atomism as prevalent in current psychology. Parallel with the modern development of the conceptions of evolution and becoming above sketched, natural science has in its field been achieving the greatest apparent success yet known to man. We are not called upon to approve all that has been done in the name of this science, but its

commanding influence none can deny. It would appear, too, that these successes of natural science have proved as truly dazzling to highly trained minds in other fields as to the common man. Scientific methods devised for dealing with physical problems have been allowed to determine the methods used for dealing with human phenomena, even though in so doing the most valuable elements in human life had thereby to be refused a just consideration.

The history of these natural scientific methods we may trace to Newton and to his acceptance of the Cartesian dualism. The study of science was by the mind, but the object of such study excluded any and all mind. Newton counted that "God in the beginning formed matter in solid, massy, hard, impenetrable, movable particles . . . so very hard as never to wear or break to pieces." All physical phenomena were the result of the moving and compounding of such particles. Granted the laws of their movements, all their future movements could be foretold from the state of affairs at any given time of reference. All the more complex phenomena were at bottom explicable in terms of these simplest elements, the "higher" thus in terms of the "lower." Secondary qualities as colour, sound, taste, or touch became as such unreal, being of necessity reduced to their physical components. The mind of man as a natural phenomenon was itself ultimately to be explained in terms of physics and chemistry.

Of course, psychology could not in fact begin with the physical atom. On that basis it could not even get a start toward itself. But it could use this method of structural analysis, beginning as far down as it was possible to go, and this the natural scientific school of psychology has done. The beginning element has been such as the conditioned reflex or the single stimulus-response bond. On the basis of this unit-element of study was all explanation of psychological phenomena to be built. That much has

been achieved by this psychology the writer of these lines has no wish to deny—he feels himself much indebted to it —but just as Newton ignored or denied secondary qualities, so do these psychologists tend to belittle or ignore conscious action and purposing and personality at least until these can be explained in terms of the simple elements assumed to underlie all else. The result has been a psychology better fitted to describe the movement of rats than to guide the richer lives of men. Under its influence education—unless otherwise counteracted—has tended to reduce itself to such mechanical processes as habits, skills and other assignable procedures. More recently measurement as the willing hand-maiden of the movement has attracted many, particularly in the United States, by its promise of more efficient results. The actual result has been an even more desiccated dryness. And now at length the tide turns.

Several things have united to turn acceptance away from this atomistic effort to treat of life. A general sense of its failure has prepared the way for the more human, even if at times bizarre, efforts of Freud and his school to deal quite directly with personality as such. It is the old story: nature driven out of the door comes back through the window. The Gestalt movement is another sign that mechanical simples do not suffice for dealing with human experiences. Even laboratory experiments on rats seem to deny the single S-R bond theory or anything like it. And still further has later physics left Newton and exposed his unwarranted metaphysical assumptions. The new science calls in question the old notions of scientific method. Meanwhile from the time of William James there had been a growing movement which, founding the study of man upon the actual human experience, had already anticipated the implications of modern physics here pertinent. It is in line with this last tendency, as developed by Dewey, that our author writes.

The reader, then, is asked to see in the pages which follow a most serious effort to bring educational methodology abreast of the best modern thought. The conception of becoming has been happily chosen as the key to a more adequate approach. By means of it even logic takes on more dynamic character and becomes therein more useful in a changing civilization. Behaviour, with which psychology is fundamentally concerned, is defined in a manner promising of highly fruitful results. The stimulus-response conception is reinterpreted so as to give it a still useful but distinctly subordinate position. Learning is conceived in far more useful fashion, relating it on the one hand to the essential purposiveness of conduct and on the other to an all pervasive structure building. The role of the educator is sketched in clearer lines as we see the child in purposeful activity becoming increasingly self-directing through the responsible application of intelligence to his own experience. In the aggregate as well as in detail the study and practice of education promise to be materially furthered. Hard will be that reader to please and far advanced his previous thinking who does not leave this book feeling distinctly indebted to its very capable author.

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CHAPTER I

INTRODUCTION

IN present day American educational thought a student of educational method is confronted by a great variety of conflicting positions, ill digested ideas, and contradictory practices. Education is a new science, and has borrowed freely from different sources, has adopted concepts and categories from many fields, and is utilizing methods belonging to different—often conflicting—theories. Apart from mere tradition, its original practices emerged from the philosophy of the period of enlightenment, and these are still to be found side by side with procedures and thinking prompted by the application of modern scientific method. More recently have come the theories and practices of the so-called progressives, which, if thoroughly examined, will be found to be fundamentally in opposition to those of both these other tendencies. We can thus observe the paradoxical situation of creative education for a dynamic society operating in conjunction with types of education that aim to drill future generations in the static essentials of culture. Child-centred schools that emphasize the integration of an active personality are trying to foster respect for an integrated personality while often basing their treatment of children on a psychology the method of which dissolves personality into atomistic and mechanistic aggregates of traits, reflexes, and inborn tendencies.

Within this general confusion in current educational thought, there are many phases that seem to arise from mere incidental practice possessing no apparent theoretical basis. However, there is essentially some kind of philosophy, or some kind of general theoretical position behind all educational practice, whether implicitly assumed

or explicitly stated, although this is a view that has been repudiated by some recent schools of thought. Absence of explicit statements of theoretical positions, and the contradiction of practices, are due to lack of "thinking through," lack of intelligent reflection, and lack of methodological inquiry. This need of an adequate theoretical background is especially evident in our progressive education. Its assumptions are by no means clear, and its practices often show lack of systematic thought. Our progressive educational thought has reconstructed itself only in part. It continues to cling to viewpoints and practices that spring from an outlook entirely different from the one to which it openly holds.

This situation of antithesis and contradiction is by no means unique in education. It is shared by all humanistic and social sciences. But the issue seems to be sharper in the field of education. Education's function is to guide the thinking of future generations, and consequently it is especially important in this field to guard against tendencies that hamper clearness of thought.

The bulk of our present educational thinking and practice is based on the old view that human life, culture, and moral systems are essentially static and unchanging; that conduct and human experience can be explained and understood in terms of static, substantive concepts; that change and processes are unreal and secondary to the existential unit-realities; and that the role of education is to fix in the minds of the young generation established truths, values, and informations. Recent trends in education have created aims very different from those existing previously; yet withal these new trends have been unable to maintain consistency in their positions, and they still utilize methods of thinking and concepts that belong to the very educational theory they are opposing.

A situation such as this is due primarily to an inadequacy of methodological study. The educational aims of today demand thorough changes in educational thought as a whole, and in its underlying fundamental conceptions.

This is true not only of education. It is true of all domains of thought.

Bridgman has pointed out that "each new activity in the domain of thought calls for new reconsideration of some fundamental conceptions."[1] This is precisely what the humanistic sciences need today. The history of thought reveals many such transformations in the field of thinking. The most recent and the most thorough-going has been the one productive of the "scientific method." This method has revolutionized thinking in natural sciences and has freed it from the abstract and fruitless speculations of medieval philosophy. For the last century this method of the exact sciences has had such brilliant results that it has been uncritically accepted by all other sciences, and has coloured our ways of thinking to such an extent that the nineteenth century can rightly be called the era of the scientific method. The fact that such a method might not be suitable for the purposes of the human sciences has been overlooked. Only recently, and also only in part, the social and humanistic sciences have grown aware of the differences of their own subject matter from that of the exact sciences, and have made some attempts towards the construction of a methodology of their own. There have been in this connection efforts to reconsider the assumptions on which the method of the natural sciences is built, because thinkers in the field of human sciences are gradually reaching the conviction that some important aspects of human experience have been consistently neglected or misinterpreted, and that this neglect and misinterpretation is due to some peculiarity in the structure of the scientific method and its assumptions.

In this connection the idea of "method" itself needs clarification. It can be interpreted in two ways. Method may mean a general intelligent and rational way of investigation. Method in this sense includes requirements like the fair and objective observation of facts, the evaluation of data with the best available critical thought,

[1] *Logic of Modern Physics*, p. 2.

logical and unbiased procedure in their treatment. Method thus understood presents the most general conditions of rational inquiry, but does not limit itself to specific techniques. If method is taken in this wider sense, one can accept the statement that there is a method general and common to all scientific investigation, no matter what the specific field is.

On the other hand, method may refer merely to a certain specific technique, to certain specific devices, certain specific ways of observation and of treatment of data. Method in the first sense can be applied to any type of problem and must be applied to all problems. Method in the latter sense is specific, and is specifically adapted to a certain type of problem only. The scientific method, as it has come to be understood in its applications to education and human sciences in general, is a method in the latter sense. It has identified itself with quantitative measurement, separation of variables, statistical treatment of data, and a laboratory attitude towards human personality and the phenomena of human conduct.

Recent educational thought has in very great measure pinned its faith on the scientific method in such a narrower sense. It has even gone further: it has very largely misinterpreted that method. In many educational theories of today scientific method is taken at its face value as its own standard and as a sure guarantee of scientific results. It is often believed that all that is necessary in order to attain a desired result, is to apply some specific scientific procedure. The application of statistics, for instance, is expected to render adequacy and scientific value to any inadequate research or investigation.

There is one fundamental methodological error in such an attitude, namely, that a method does not carry with itself the criteria for its adequacy. Method is a tool, and its virtue depends on how adequately it helps to form and to solve the problems in the field to which it is applied. Each type of subject matter has its own unique characteristics. To these, method must adapt itself.

In the case of a transfer of a method from one field to another, one first must investigate the structure of phenomena in the respective fields before proceeding to apply certain techniques in dealing with them. In the specific case of the application of the scientific method (in its narrower sense) to the human sciences this precaution has not always been observed because of an uncritical faith in the omnipotence of the method in question. The intimate connection between the scientific method and its original subject matter has been lost sight of, and the method has been regarded not as a tool, not as secondary to the demands of the subject of investigation, but as primary and self-sufficient. Quantitative measurement and laboratory experimentation under artificial and abstract conditions have proved valuable tools in the investigation of physical phenomena. Therefore, it is assumed that the results of such procedure will be of the same scientific value, and of the same adequacy, in dealing with the quite different problem of human conduct. The search for ultimate elementary units has been one of the main aims of the exact sciences. Psychology, in adopting the scientific method, has too often pursued these same aims yet without questioning how valuable and how suitable such procedure is for an adequate dealing with psychic phenomena. The result has been that problems in the humanistic sciences have been formulated and selected by the method rather than by the needs in the field itself. The method has first blurred our view of the subject matter, and then taken upon itself to decide what facts and results are to be regarded as important.

This divorcing of subject matter from *its* particular method, the uncritical transfer of the method of one field to another field of different type, has proved fatal for research in the human sciences, especially as the subject matter in the latter fields is plastic, yielding to a method of treatment rather than forming or moulding it as in the case of the physical sciences.

The disastrous effects of such transfers are quite apparent today. Frederic A. Ogg has observed that

research in humanistic and social sciences is lagging far behind research in exact sciences, and that "studies undertaken are ill-planned, crudely executed, and barren of significant results. . . . Methods of investigation are imperfectly developed and fields capable of contributing richly to one another are not adequately linked up."[1] It is true that this state of research in the humanistic sciences is in large measure due to the complexity of the problems these fields offer; but it is also to a large extent due to an uncritical acceptance of the technique of the exact sciences. Furthermore, method-consciousness on the part of the humanistic sciences, and efforts to construct methodologies of their own, have been curtailed by unquestioning acceptance of what has been borrowed elsewhere.

Another fact ignored by those using the technique of exact sciences in dealing with problems of human conduct is that a method is not an empty vessel which can be filled with new subject matter. Method, in its narrower sense, consists of a certain body of general conceptions, of categories of thinking, and of positive assumptions about matter, existence, processes, interaction, the nature of the world, and so on. Behind each method of research there is a certain philosophy, whether it is explicitly stated or unconsciously assumed and implied in the structure of the method itself. Thus the scientific method indulges in some positive assumptions about reality, about substance and its relation to the phenomena of life and the physical world. It has also certain notions as to the category of inter-relation and interactivity, summarized under its theory of causality. Many of these assumptions, if they were stated explicitly, would be recognized as incompatible with the basic theories held by the human sciences at their present stage. Yet because they are not explicit they are seldom brought to light and subjected to criticism, although they influence thinking indirectly through the methods of research and through certain concepts and categories employed.

[1] *Research in the Humanistic and Social Science*, pp. 17-19.

Resistance is always encountered to any reconsideration of assumptions that are very deeply ingrained and taken for granted. In the case of the humanistic sciences any attack on these assumptions is complicated by the justifiable prestige scientific technique enjoys in its proper fields. Uncritical acceptance of this technique suppresses questions of reconsideration as unimportant and unnecessary, or holds that the alternative to a particular adopted scientific technique is a technique that is not scientific—that harks back to medievalism. If the scientific method is believed to be utterly devoid of any bias, of any lack of objectivity, of any lack of positive and limiting theories, then it is natural that the consideration of basic assumptions be thought of as an unnecessary and trivial task.

The danger in following the modes of thinking dictated by the method of the exact sciences is that the concepts, the categories, and the ways of formulating problems, as imported from the field of the exact sciences, may not be the best to use in dealing with the subject matter of the human sciences. A difference in the phenomena in humanistic sciences calls for a different set of concepts and categories of thinking, for different methods for finding facts, and for different ways of formulating the problems, all of which can be adequately accomplished only when quite a new start is made in the methodology of these

The conviction that the theories and the methods of the physical sciences will not do for the humanistic sciences has been voiced quite strongly not only by recent thinkers in the field of the humanistic sciences, but also by those engaged in the exact sciences themselves. Thus Lewis makes the following statement:

"It is indisputable that many of the characteristics of living beings are not only far beyond the reach of existing physical sciences but are not even suggested by the most remote extrapolation of the laws and theories that we have made to fit the inorganic world. We see no limit to the interesting and useful results that will inevitably come from

a further application of the methods of physics and chemistry to the physiology of animals and plants. Yet the belief that even an infinite succession of such investigations would ultimately lead to a comprehensive understanding of vital phenomena seems to be one of these illusions which blind our eyes to many interesting trails that should tempt the scientific explorer."[1]

The present discussion is not an attempt to advocate a wholesale rejection of the use of our current scientific methods in the social sciences and in education. There is much to be gained by applying to the social sciences what has been achieved in the way of research methods in the exact sciences. The harm that has come through such application is due primarily to the exclusive and uncritical usage of certain techniques only, to the monopoly of certain specific methods only, and to the lack of criticism of the fundamental assumptions that accompany such applications.

It is precisely because of this uncritical application of the scientific method that we are justified in concentrating attention on it in a discussion of dynamic education, seeing that the scientific method as discussed here—despite its great value to education—has incorporated, and tends to perpetuate, a host of positions and concepts that are definitely unfitted to deal adequately with social life and a changing world. Among these detrimental effects sponsored by an unthinking adoption of the scientific method are the fostering of atomism, separation, fixed one-to-one relationships of cause and effect, mechanistic concepts, and very often a "substantialization" of the fundamental concepts. This incorporation of alien concepts into educational thinking is the natural result of an uncritical reverence for the technique of the scientific method. Education requires emancipation from these dicta in order to give room for new outlooks and provide for the reconstruction and revision of its fundamentals. For this a criticism of the bodily transfer of the techniques of the scientific method from the fields to which they are

[1] *Anatomy of Science*, p. 195.

adapted to those fields to which they are not adapted is imperative.

The present study is attempting, through an extensive excursion into all fields that have shown some evidence of dynamic tendencies, to reconsider certain current concepts used in education and other human sciences, especially those having to do with experience. In the reconsideration of these concepts it is hoped to be able to fill them with content that will be helpful in furthering the dynamic outlook, and especially in directing research in human experience and education to problems more relevant from such a standpoint than many now being studied. An effort will be made to reach the deep-lying bases from which any analysis of experience or of human phenomena must start, and then to apply the characteristics of such a basic concept to a group of working concepts such as experience, environment, concepts dealing with the relation of the individual to his environment, and the elementary functions of the modes of thinking.

Furthermore, an attempt will also be made to state these concepts in operational terms, and, as far as possible, not limit their usage to any fixed positive contents or theories of a closed nature.

As the method or way of interaction of phenomena and of the constituent elements of a complex situation is a basic clue to their understanding, an attempt will be made to look into the laws, modes, and methods involved in the intercourse of phenomena, seeking to provide them with a dynamic interpretation, and make them serve as a guide for the analysis of human experience in the light of dynamic methodological principles.

CHAPTER II

BECOMING

I

ALL disciplines, intentionally or unintentionally, are centred around certain elements, certain specific functions and aspects, which can be analysed out of the gross total of the given phenomenon of experience. Even the smallest instance of reality has almost infinite possibilities of being disintegrated into smaller and simpler, or at any rate into different, elements or aspects, corresponding to the purpose of the study.

Thus a piece of steel, for a technologist constructing a bridge, needs to be discriminated from other similar metals as to resistance, weight, durability. The physicist makes a further analysis of the same piece of steel. He will consider the motion of its electrons, its magnetic and electrical properties. A chemist wants to know the chemical elements that enter into the composition of steel. Each studies the same thing from a different point of view, and each, through the corresponding level of analysis, draws out the facts most needed for his purpose.

Though each of these investigations may hold the findings of the other useful for supplementary explanations, the main weight of each study will lie around the facts drawn from its own level of analysis. In each case some ultimate limit is set to the dissecting function of analysis, a certain level of decomposing is found as necessary for the study of certain types of phenomena. For the technologist, it is the behaviour of steel, for the physicist, the behaviour of electrons, for the chemist, the composing chemical elements.

One could thus furnish a line of instances in which analysis proceeds further and further down from what is called " steel " in our ordinary experience. Yet in every

case the main weight of the problem is set at a certain level of that process tending from the complex to the elemental.

This centre or level of analysis may be called a unit of study. A unit of study is a methodological necessity, imperative for any discipline, in order to limit the field to those elements and functions that are important to the study undertaken, and in order to secure an adequate basis for the formulation of the problems.

Units of study cannot be set up externally. They must grow out of the specific purposes involved in specific cases. Only in so far as there is a certain affinity of purpose can one talk of a certain level of analysis for a certain group of sciences. On this basis one may state that the sciences dealing with human phenomena, though differing among themselves in specific purpose and in specific levels of analysis, deal in general on a less elemental basis than the exact sciences.

Unfortunately, the history of science shows us that such methodological considerations in delimiting the units for different sciences have not been followed. Rather, it shows us that those considerations have been influenced by others, alien to methodology. Thus, the influence of metaphysics has identified units of study with ultimate, existential reality ; while the authority of natural sciences has forced their last unit—which is an elemental, a simple, from the analytic standpoint—on sciences of an entirely different type and purpose, requiring consequently different types of units. Metaphysical considerations have also added the demand for something fixed and static and ultimate. The result of these two influences—that of metaphysics and that of the natural sciences—on the human sciences (and on psychology especially) has been to push their units of study farther down the line of analytical decomposing than is good for their purpose. Present day psychology gives a good example of this methodological fallacy. Sensations and nerve currents have wrested for themselves a virtual monopoly in psychological thought, as over against meaningful

behaviour. And to explain the latter is, after all, the main purpose of psychology. In consequence we find educational psychology busy, for example, experimenting with fragmentary, unimportant learnings in its endeavour to explain how learning occurs.

To be consistent with the tendency thus far followed, psychology should persist in its pursuit of the elemental down to the study of the atomic structure of nerve currents. In fact, it probably would have done so, were it not that such a study is so obviously within the province of physiology. The result, at any rate, has been that certain functions in which psychology, as the science of human behaviour, should be interested, have not been noticed, or at least have not been dealt with. It is a recognized fact that atomistic psychology has constructed itself around a unit that bears the influence of both the metaphysical outlook and the laboratory attitude of physical sciences, and that the unit for study of human behaviour—sensation or the reflex—has been pushed too far down the line of analytic simplicity to provide for the impartial consideration of all the factors and aspects of human behaviour important from the standpoint of understanding that behaviour. It is necessary to centre attention around the phenomena that are complex enough to include all aspects worthy of attention, and then to consider the simpler functions and elements in the light of such more complex phenomena. It should be borne in mind that in connection with human behaviour the analytically simple and logically primary is not necessarily simple and primary from the standpoint of behaviour. In other words, it is wrong to assume that the last elements in analysis are the first ones in experience. In studying experience, an arbitrarily selected simple unit is not to be assumed as the best one to start with. The point is, that in order to get a fair statement and explanation of human and social phenomena, we should determine the unit of study in terms of these phenomena, so as to obtain a unit for analysis that includes everything that is relevant from this standpoint.

Experience used as an approach to life's phenomena tells us where to look for that starting point or unit of study. This unit of experience might be called a simple, but only a simple—that is, *a simple only from a certain point of view*, as there are no simples that are to be considered equally simple from the points of view of all sciences.

The analysis of macroscopic experience and of human behaviour shows that dynamics is an essential characteristic of both. Life and behaviour phenomena are processes; substances, objects, existentials are but passing elements in those processes taking on different aspects according to the role they have in that process. It is natural then that the demands of empirical method—to start with macroscopic experience—includes the necessity of starting with processes, with objects, things, subjects in their interaction. In order to learn about experience we should keep the experiential situation intact, and that situation includes inter-relations and processes as well as comparatively static elements. All major problems of human behaviour—those of organism and environmental relations, relations of mind and body, intelligence, consciousness, stimulus and reaction, and the role of meaning—can be adequately studied only from such a dynamic standpoint. They must be regarded first and foremost as parts of a dynamic, ongoing process of life, which we call experience, and of which the behaviour act is a unit.

The behaviour act, therefore, seems to be an adequate unit of study or centre for the analysis of human conduct, throwing light on the properties and relations mentioned above. By dissecting the behaviour act we arrive at something that no longer can be called behaviour. Yet this does not mean, naturally, that analysis should for no purpose proceed further. We are anxious to emphasize the fact that there are experiential limits to some qualities, and that those qualities cease to be when the unit is split any further. To know the qualities of water we must study water itself in contact with other things. An

analysis into hydrogen and oxygen may prove helpful, but we must take care not to presume that the aspects of behaviour of either hydrogen or oxygen are in any way analogous to those of water, or, what is more important in this particular illustration, that the behaviour of oxygen or hydrogen in the combination "water" is going to exhibit the characteristics of the behaviour of oxygen or hydrogen in isolation. The same is true of human conduct and its study. Yet a professed scientific psychology of behaviour and of education is full of deductions based on such analogous procedures. Genetic elements are taken for pure data of experience, as is shown by the substitution of isolated nerve reactions for meaningful behaviour, and other fallacies of a similar type. The failure to see experience as the process, and the different qualities of it as the functional aspects of that process, failings that are results of a dis-centred unit of study, has resulted in curious absurdities in regard to those qualities that inherently belong to the *process* and not to any specific *participants* of that process, such as the subject or the object.

Units of study determine the scope of the subject matter for any discipline. Properties, qualities, and functions not included in that unit will also not be considered in the investigation. This has been demonstrated clearly enough by behaviouristic psychology, which has postulated as its unit the sensation and reflex, both of which are meaningless, mechanistic processes. The whole system, consequently, ignores meaning as a factor of behaviour and advances a purely mechanistic theory.

Because of unconscious metaphysical preconceptions the unit has been identified with the structurally simple, a simple that is such only from the standpoint of structural analysis. The fact was overlooked that what is simple from the standpoint of structural analysis need by no means be simple from the standpoint of behaviour. Another fallacy connected with this has been the attribution of a generic primacy to the simple thus analytically

derived. Sensation or reflex, logically considered as a more simple unit than a behaviour act that includes the integration of reflexes and responses more complex than sensations, naturally become the "irreducibles" of behaviour, the generically primary ones, from which the other, more complicated forms, are to be derived. This has led to the study of behaviour from the wrong end up, the inevitable consequence of which has been the overlooking of some phenomena quite important in human behaviour, such as meanings and thought.

Perceptual and thought processes are as hard and fast facts of behaviour as the sensations of blue and red. They therefore cannot be reduced to elements from which they are to be predicted; such an assumption is no more justifiable than the expectation that "the congenitally blind person could tell what red is from a knowledge of the corpuscular theory of light."[1]

It is only by activity of some kind that we learn about things around us. There is no way of knowing about something that is absolutely passive or that is productive of no effects upon our senses or upon other objects. As in the physical sciences we learn about matter through its effects upon our senses and upon other matter, so in human behaviour we learn about the components of behaviour in terms of behaviour itself, that is, in terms of responses, in terms of behaviour activity. But the important point here is that in behaviour activity *the responses do not run independently of each other*. They interact with other responses and sensibilities, either active or latent at the moment, and they change their courses according to the effects of such interaction.

Furthermore, the responses themselves are not made to single stimuli or objects of the environment, but to those stimuli and objects in relation to other stimuli and objects. Human behaviour is interactive and interdependent in its texture. Consequently, one single response studied in atomistic laboratory fashion cannot be understood adequately by itself alone. It must be

[1] Helson, *American Journal of Psychology*, 1925, p. 194.

viewed in relation to others, active at the same time or preceding it. Single components of human behaviour are not neutral to each other. They are interactive and interdependent, and receive their specific colour from such interdependence. A method of study that neglects this fact of interdependence is quite unable to view behaviour in its true and full reality. Consequently, it is necessary that the unit for the study of behaviour be of a type and level of complexity accurately representative of true behaviour, which means it must be a unit conserving those essential characteristics of activity and interactivity.

It is the maxim of the empirical method to start with macroscopic experience and not with its isolated and abstract elements. By following this maxim we are more likely to discover the exact properties and important factors of the so-called elements and simple processes. The use of the behaviour act as a unit will serve to guide the analytical process, and will point to, (1) all factors and elements that make a difference in the behaviour process, and (2) the relations and functions in which those elements stand to each other, regardless of their existential classification. It will point equally to our wishes, beliefs, and ideas, as well as to objects outside us and nervous currents inside us, thus assuring an unbiased treatment of the matter. It will point towards these as functional parts of the behaviour process, and not as independent existentials.

II

An implied argument for the adoption by the human sciences of the approach employed in the physical sciences is the fact that the latter have developed a valid method that has been instrumental in attaining brilliant achievements in the particular field to which it is peculiarly adapted. The methodology of the physical sciences was transferred to the humanistic sciences as a sort of guarantee for success. But meanwhile the fundamental structure of the methodology of thinking in the natural sciences has

undergone a revolutionary reconstruction. Consequently, if the human sciences wish to profit from thinking in that field, they should borrow not so much from the *old* but from the *new* science.

The fundamental conceptions of traditional science were imbued with the characteristics of substance and the material; dynamic processes were considered as secondary to mass. The so-called ultimate units or elements that stood for reality were essentially static, whether expressed as mathematical relations or in some other way; and all that represented change and process was effected through the shuffling around of those ultimate and unchangeable units. The picture of nature as drawn by traditional science was that of a "rigid scheme of spatial and anti-temporal cause and effect relation," as Spengler has characterized it. There was no inherent and necessary distinction between *being* and *becoming*; no qualitative difference, in so far as the fundamental laws of science were concerned, between the right and left relation and that of past and future. By the picture of the universe derived from the primary laws of physics, the universe might as well run backwards as forwards. Even the notion of energy was only a name for the quantitative aspect of the mechanistic structure of mass.

The notion of activity, of dynamics, being excluded from the nature of the reality of elements, process in general became a sequence of instants floating in the stream of time, which later in turn broke up the natural continuity of processes and resulted in an isolation and segregation of natural events. This general substantive attitude laid its stamp on all general categories and concepts. These were imbued with the characteristics of substance, material results, things become, all attributes which belonged to the materials on which the process was realized and not to the activity itself. Thus the notions of energy, object, cause, gravitation, consciousness, mind —even those of actuality and action—were conceived substantially. As Spengler has pointed out, "actuality and action were thought of as conditions, and therefore

ranked in the category of being."[1] He further adds,[2] that the scientific scheme was "unconscious of the fundamental absurdity of science which sought to understand an organic becoming by methodically misunderstanding it as the machinery of things become and thus disfiguring the visible face of the *becoming*."[3]

Yet becoming, meaning cumulative, qualitative change, is one of the most fundamental aspects of organic phenomena. Ignoring this aspect has been fatal for sciences that have been dealing with organic phenomena in a mechanistic manner.

In its best examples, modern thought in the physical sciences is much more dynamic than it was previously. Its concepts now include the aspects of continuity and activity until recently considered as characteristics of the organic world only. Some writers (Whitehead for example) have interpreted this trend as leading to the possibility of all the physical sciences becoming a study of organisms. The only difference between physics and biology would then be that biology is dealing with large organisms and physics with small ones.[4] How much truth there is in such a prediction cannot be discussed here. Yet it is an undeniable fact that the sharp distinction that was supposed to exist between physical and organic phenomena has broken down. Experiments in organic chemistry such as those referred to by Lewis[5] have definitely served to shatter this distinction. And it is also true that modern physics has introduced into its field concepts that indicate dynamic continuity, explaining phenomena that cannot be understood from the atomistic study of isolated event-instants only. The fourth dimension, or becoming in time, is one of such concepts.

[1] *The Decline of the West*, p. 53.

[2] Idem, p. 152.

[3] The present writer, by using the term *becoming* does not accept the Spenglerian teleological interpretation of it, nor the destiny idea. This term seems to be useful in denoting the cumulative, qualitative, non-mechanical change.

[4] Whitehead, *Science and the Modern World*, p. 150.

[5] *Anatomy of Science*, p. 150ff.

Eddington maintains that becoming in time has grown to be the very essence of the world we live in and the world we conceive.

"The fourth dimension," he says, "required no introduction; as soon as we began to consider events it was there. Events obviously have a fourfold order which we can dissect into right or left, behind or in front, above or below, sooner or later—or into many alternative sets of fourfold specification. The fourth dimension is not a difficult conception. It is not difficult to conceive events as ordered in four dimensions; it is impossible to conceive them otherwise. The trouble begins when we continue further along this line of thought, because by long custom we have divided the world of events into three-dimensional sections or instants, and regarded the piling of the instants as something distinct from a dimension. That gives us the usual conception of a three-dimensional world floating in the stream of time."[1]

Eddington believes that to think of a man as apart from his duration is just as abstract a process as to think of a man without his inside, and that we find it easier to do so only because of our habits of thought.

The notion of entropy now prevalent in the physical sciences has also introduced the notion of organization of energy in some cumulative fashion. One does not need to accept Eddington's interpretation of such organization as a running down of the universe in order to see that this concept, along with that of the fourth dimension, cannot emerge from a mere microscopic world-splitting. They cannot be derived from a study of atoms, of elements, or their aggregations. In order to conceive such concepts one is compelled to postulate some process permeating and uniting the elements in some organized manner, even if such organization is performed only in terms of time and space. These concepts have introduced new points of view, points of view that consider "the constellation just as seriously as the stars" where the older science was preoccupied chiefly with the stars.

[1] Eddington, A. S., *The Nature of the Physical World*, p. 52.

The notion of organization immediately introduces the notions of continuity and the interdependence of the part and the whole.

> "Thus, in the study of the falling stone the microscopic analysis reveals myriads of separate molecules. The energy of the stone is distributed among the molecules, the sum of the energies of the molecules making up the energy of the stone. But we cannot distribute in that way the organization or the random element in the motions. It would be meaningless to say that a particular fraction of the organization is located in a particular molecule."[1]

Though the physical ongoing may not have much in common with the familiar ongoing in time, there is something in it which so far has been associated with the organic world only, namely, the characteristic that dispels isolated, static atomism, a characteristic that belongs to the dynamic succession of events and not to any single event or phenomenon. Consequently, arguments relying on the authority of the physical sciences used in opposing the study of phenomena of similar structure in the human sciences should not possess the weight attributed to them at present. Modern science is neither static, nor purely atomistic, nor substantial. It is breaking down the separate categories of "things," "influences," and "forms"[2] and is paying more attention to the common dynamic background of all phenomena. It tends to indicate that reality is not to be found in isolated existences but in dynamic forces and processes, and that the former are results of the latter, a point that the present study is anxious to establish in the field of organic and human phenomena. Change, which thus far has been excluded from the primary consideration of science and also from any serious philosophy, and has been regarded as a secondary, subjective aspect of human experience, seems to be acquiring its proper place and its proper importance.

[1] Eddington, *The Nature of the Physical World*, p. 103.

[2] Eddington, op. cit., Introduction.

Process in physics is quantitatively conceived. In organic fields one has a right to talk of change in connection with process. In the organic field change includes the qualitative as well as the quantitative aspect. Things not only become in time but they become in quality. If the "atom of action" was a revolutionary concept in physical science, the notion of becoming, whether expressed by this term or another, is still more revolutionary in the field of sciences dealing with organic and human phenomena. The fact that process and change in organic events are not only quantitative but qualitative makes much more thoroughgoing the implications of introducing these concepts in the fundamental scheme of understanding those events. Not only is the revision of certain concepts and categories required; the revision of our entire world picture and emotional associations established in connection with words, concepts and ideas is implied. If the new physical science "involves change which cannot be stated immediately in plain terms, because one has first to grasp new conceptions undreamt of in the classical scheme of physics,"[1] it is much more so in organic and human fields. So much so that it is almost impossible to deal with it argumentatively. The change in the organic field will demand not only a revision of modes of thought but also a revision of modes of feeling. The dynamic re-interpretation here goes much deeper, into more refined implications that touch the most subtle and vital shades in our conception of life, grasping not only the ideas and concepts about things, but also the most unrationalized feeling-tones determining our responses.

Several characteristics of the process of the ongoing of events, different from the "scientific" conception of it, can be distinguished in organic and human processes, namely, irreversibility and directedness, continuity and organic inter-relatedness, and the emergence of new patterns.

[1] Eddington, op. cit., p. 4.

Irreversibility[1] and directedness seem to imply each other: directed processes are irreversible. In the world of familiar experience things go on in a certain one-way direction, and there is nothing that can undo the event that has once happened. This one-way ongoing is inherent in the conceptions indicating organic change. Thus development, growth, evolution, indicate a process that makes sense only in one direction, in the direction of onward, and is without sense if read in a reversed direction. We cannot reverse the growth of a tree, restoring the full-grown plant to its seed form, although new seed can come from the tree. On the other hand, physical or chemical processes as such can be done or undone. One can disintegrate water into hydrogen and oxygen, and one can also make water again out of the same hydrogen and oxygen, and the new water will have the same qualities as the previous water possessed. Organic events, however, are of a different type, human events still more so. Anything happening to the organism—that is, an event evoking a definite response—leaves its trace, so that the next event is in some way affected by it. There is a change in the structure of its responses. The process inevitably has to go on from the point at which it was left by the past event. One cannot reverse the processes, one cannot compose and decompose organisms and have the identical results at both ends. Organisms possess the quality of being plastic and sensitive to the influences with which they come into contact. Organisms have a memory—an organic memory. Each successive event in the course of organic behaviour is being changed by the preceding event.

The same is true of events in life in general. Everything that has happened is laid to account one way or another. We cannot undo, in any direct sense, things

[1] Eddington has attempted to introduce irreversibility as an aspect of physical events, in connection with one-way running of time (op. cit., pp. 67, 97). This is repudiated by Lewis: "In all physics including the second law of thermodynamics there is no need of introducing a distinction between past and future nor any concept of time except what we have called a two-way time which may be regarded as only one mode of extension in our four-dimensional manifold of kinematics" (*Anatomy of Science*, p. 156).

that have happened. "Everything is unique, and incapable of being repeated. It carries the hall mark of Direction (Time), of Irreversibility."[1] "The living is indivisible and irreversible."[2] This directedness must not be conceived of as directedness towards some one definitely-set goal. It must not be interpreted as a unidirectional line of ongoing. It is a notion of directedness implying only a certain structure of becoming without any direct reference to any particular goal or standard. To say that a process is irreversibly directed is equivalent to saying that that process has some inherent organization that cannot be reversed without making the whole senseless. It is a continuity that works only one way.

When we view the world as an assemblage of existing things, utter discontinuity seems to prevail. Each thing, each object, each quality, has a separate existence of its own, and there seems to be nothing to unify them except external co-existence in place or succession in time. The only unity that the static and absolutistic view of the world is able to show is that of phenomena belonging to the same group, or class, or of phenomena belonging together in time or space—which unity is really only illusory. A static world is thus a world of isolated existences. But when we look at the world dynamically we see processes and events that offer a much more continuous picture. One event follows another with a certain necessity, a certain connection. Underlying the more complex events and processes are the more fundamental processes, which can be traced back to the very conditions of phenomena, material, physical, or organic.

Continuity of events is very familiar to us from our ordinary experience. We think of our ideas as generating actions; we think of certain circumstances as "making" us do something. Events follow each other in an apparent necessity, and while there are mysterious gaps between

[1] Spengler, op. cit., p. 56.
[2] Idem, p. 122.

the events of the mind and the external events, there is no question as to how one existence could influence another, there is no mystery as to causality.

The continuity of the familiar world is not an illusion as to the continuity of existences. It *is* a continuity—but a continuity of processes only. Life and the world viewed as a conglomeration of isolated existences is static and discontinuous. Life viewed as a succession of events is continuous. Processes are by their nature continuous, which means that each successive event " grows " out of the preceding, with a compulsion that is simple enough to perceive, and which implies some necessity, some kind of belonging together.

The connection between them is not something mysterious and unintelligible. One event determines another event, and the past is active in the functioning of the present. The connection between the past and the present is not mechanically causal but organic and vital. There is a compulsion in the events, which one can be aware of in a single event. One does not need any recurrence of the same succession of events in order to see this compulsion, as so many theories as to causality want us to believe (Hume's, for instance). It is hard to see how the acorn as an existence has something to do with the oak. Yet when we view the process resulting from the interaction of certain protoplasmic functions of the acorn with the functions of temperature, air, and soil, we can easily follow the continuity of the transformation of those functions, until the resultant functioning takes the form of a tree. Every organic phenomenon implies the conception of development, and development can be understood as such continuity of functioning. Through all the qualitatively different existential levels producing different resultants, runs that form of continuity of processes that we can call becoming.

This progressively determining causality and this similarity of some very basic fundamental processes is what renders continuity to all events, a continuity not possessed by things viewed as static existentials.

The original materials of life have undergone and still undergo a constant reorganization, and during this reorganization not only the materials are subject to remodification and emergence, but the process itself in its actual patterns of realization also suffers a change. Simple phenomena, by incorporating more and more elements and partial functions, by entering into ever-increasing relations with other phenomena, become increasingly complex. Following the scale of evolution and development, we can trace a line of events, which, when put on a scale, show qualitative differences at both ends, and which nevertheless are unified by some basic relation, by some fundamental process or processes. The farther the levels are from each other, the more different they are. Yet there is something basically the same in each of them. Only the dynamic approach to the phenomena of life can reveal this continuity clearly enough. The substantive and atomistic approach has overlooked it. And this is why the traditional world schemes have suffered either from sharp discontinuities or from identifications of phenomena that are neither entirely different nor quite identical. So frequently completely different principles have been used for the explanation—for example—of animal and of human behaviour, mechanistic association serving the purposes of the former, divine intelligence the latter. Or, on the other hand, the differences between animal or organic behaviour and human behaviour have been overlooked, and the latter has been explained by solely mechanistic or organic principles, either of which alone are inadequate as principles of explanation on the human level. Progressive organic development implies continuity in certain processes throughout all levels, but it also implies the emergence of new patterns and new relations as the process goes on. Thus neither discontinuity nor analogy based on identity are justifiable viewpoints.

The formula for such explanations on a wider scale should be on the assumption that there are basic and fundamental processes that are the same throughout the

world of organic beings, but that there is also a large number of processes and qualities that differ from level to level. There may be something in common between a sense perception and gravitation, provided the analysis goes deep enough. In tracing such fundamentals one thing seems sure: they will be found in some dynamic aspect of the organization of forces rather than in any existential properties or substantive characteristics.

This interdependence and continuity of events can be traced not only generically, in the direction of past to future; it can also be observed in a continuity among events happening simultaneously in a form of interaction. Events are inter-related and form interdependent organized unities so that a radical change in one part also produces some effect in another. Events form systems, in which one unit is a functionally dependent part of the total system and of the other units included. Noble[1] has traced such interdependence of events and the domination of a unit by a system into all physical events, into all mechanistic force relations, and sees in this the fundamental principle of all natural phenomena, whether mechanistic, organic, or human.

In the field of psychology a somewhat similar attempt to stress interdependence has been made by the Gestalt psychologists. Their concept of "whole," signifying a dependence of a part of a situation upon the whole situation, conveys a notion of the interaction and interconnection of events. But Noble's concept of domination of the unit by the system, though less definite in its meaning, seems to be more acceptable precisely because of its indefiniteness—it does not run the danger of being interpreted as a definite, spatially-circumscribed unit of existence as the concept "whole" has generally been conceived. While one frequently finds Gestalt psychologists using the term "whole" to denote certain spatial figures or groups, still there are many references to it as conveying a sense of the belonging together of certain nerve currents, or as implying some organization of

[1] *Purposive Evolution.*

thought, or a setting off of some qualities in perception by a certain attitude of the perceiving person or group.

" Wholeness " in such a sense is a methodological principle for viewing things. It is the quality of belonging together in some organized way, as contrasted to the aggregate or summative belonging together. In this sense the concept " whole " may designate some material or spatial characteristics of the world, or it may convey certain aspects of human perception, or again it may imply some characteristic of the historic cultural epoch. That is, there can be no definite content assigned to this concept, apart from its implication that processes, forces, events, form systems in which different parts are functionally interdependent and not merely in loose aggregation. Consequently, the " whole " does not derive its properties merely from its constituent parts, but also from the interaction of these parts within the whole system. The elements themselves, as parts of a whole, are functionally different from what they are in isolation.

When the world is viewed as an interdependent whole, the microscopic dissection of objects will not give us a complete view of actuality. If there are properties that are possessed only by systems as a whole then those wholes cannot be " split up and located—a little bit here and a little bit there."[1]

> " There is one ideal of survey which would look into each minute compartment of space in turn to see what it may contain and so make what it would regard as a complete inventory of the world. But this misses any world features which are not located in minute compartments. We often think that when we have completed our study of *one* we know all about two because two is one and one. We forget that we have still to make the study of ' and '—that is to say, of organization."[2]

Eddington's point is especially applicable to the study of organic phenomena because here the role played by organization is pre-eminent. Many human phenomena

[1] Eddington, op. cit., p. 103.
[2] Eddington, op. cit., pp. 103-4.

like mind, consciousness, intelligence, and so forth are the result of such organization and interdependence. Consciousness, for example, is neither in the nervous currents nor in the brain, but exactly where it appears to be, namely, in the function of perceiving and in other active modes of interaction with environment. The notion of becoming itself cannot be located in any particular instance of existing reality; it appears in an organized succession of events.

In the organic field, moreover, one and one are not two but *make* two. Thus, besides having to study an *and* we must also study the organization of the *make*. And it is evident that those *makes* cannot be located in either of the *ones* alone, nor in the *two*, but only *in the process of one and one making two*.

There is a fundamental difference between unity and belonging together in this sense, and the unity and belonging together considered by the traditional psychology. According to the latter, elements belonged together as the effect of some factor external to themselves. The unity here described is imminent in the very possibility of the existence of the elements. We first have wholes, systems of organization of the processes of becoming, and then within these the elements become actualized and discriminated.

III

The concept "becoming" holds implications that are quite thoroughgoing when applied to our view of human experience and the world in general. We are familiar with the revolutionary changes in our world picture brought about by the advent of the theory of evolution, changes that are of far greater import in human thought than the ones effected by the original, purely explanatory value of the theory. Viewing our world picture as but one phase of a developmental line continually in the process of formation gives us quite a different result from that obtained by the traditional view that gave little

consideration to the genetic background. Still more differently would we see and treat all phenomena of human experience were we to view them as moments in the further process of becoming. The evolutionary process as currently known today seems to have stopped with the human being. The human being and his modes of life are considered as self-sufficient, as final. His feelings, emotions, beliefs—human thought and ideas—these are treated *as having been formed*, as existing in their final stage, and not always *as being formed* all the time. Man has been lifted out of the developmental process, out of the process of interaction with the rest of nature, and given a kind of independence and self-sufficiency—and in this sense finality. The becoming aspect, which certainly belongs to the essence of man, has been neglected to the degree of almost non-existence. In other words, to say it with Spengler, we have forgotten that man, as a representative of the world, is a member not only of nature but also of history, which Spengler considers a second cosmos different in structure and complexion.[1] Whether history should be viewed as a second cosmos is a matter subject to question ; but there surely can be no doubt as to the developmental aspect, the becoming aspect, being different in complexion from the stable become, or as to man being more subject to it than the rest of nature. And it seems to be true, too, that thus far the more tangible aspects, things as become, have been given so much predominance in our world picture as to dim, if not at times altogether obliterate, the aspects of becoming itself, and its processes, and the differences that it makes in our view of things.

As it is, man's evolution has been traced quite as completely as the evolution of the universe. How true is each picture of various historical stages, in its exact contents, is a question that can scarcely be answered with any degree of certainty. What does appear to stand as unquestionable is that the world, as we now find it, is the product of a long process of development, which process is continuing at the present time.

[1] *Decline of the West*, p. 481.

There are two points that are important in connection with the dynamic and evolutionary approach to the phenomena of human experience. First, it is incorrect to consider the type of change in human experience that has occurred during the general evolutionary process as similar to the type of change in operation today. For one thing, as we approach our own times we observe a decided quickening of the tempo of the changes. This acceleration of the tempo is the result of previous periods of development that have increased both the materials of experience and the possibilities of their inter-organization. More and more new patterns of life processes are created with every step in evolution, and new materials and new processes thus emerge, again to undergo a more extensive, more involved reorganization. To the noted anthropologist, Franz Boas, is credited the statement that in the ice ages probably only one human idea originated. A tremendous world of ideas has been added since, and ideas are being added continuously. They serve to accelerate change and to expand and reorganize the world we live in, for ideas constitute an increasingly large part of it.

The advent of mind and communication, consequently, has caused organic evolution to take an entirely new turn. In speaking of the world of today, we have to take into account our institutions of human construction as well as physical nature and organic life.

> "A belief in organic evolution," says Dewey, "which does not extend unreservedly to the way in which the subject of experience is thought of, and which does not strive to bring the entire theory of experience and knowing into line with biological and social facts, is hardly more than Pickwickian."[1]

Evolution considered in its totality must include the evolution of thoughts, ideas, beliefs, social institutions. But evolution in this latter field is of a different type and tempo; communication, interaction, and therefore inter-organization grow always more flexible, more rapid, and more thoroughgoing in the dynamics of the changes it

[1] Dewey, J., *Creative Intelligence*, p. 35.

produces. All that is necessary in order to appreciate the difference in the amount of evolutionary changes, is a comparison of the effects of one or two ideas in a whole age of the past with the changes being produced by the multitudinous product of human thought today.

The second important point in connection with the consideration of human experience as becoming, is that any particular stage of the becoming is but a moment in further becoming. Everything that happens at any given time is to be understood as indicative of, and productive of, further developments. What we learn about present events derives its importance from the possibilities offered by this knowledge in explaining, understanding and partly producing what is yet to come. We live facing the future; we wish to understand future events better and better; and we wish to live better and better. The descent is interesting because, and to the extent that, it indicates the ascent. Genetic studies are necessary because we desire to predict the behaviour of organisms or the behaviour of parts of organisms. We want to know how meanings become operative in human behaviour in order to try to know how a human being is going to behave under certain circumstances.

The subordination of past to present and future has not received the attention that it deserves, although the role this function of subordination plays in our experience is so considerable. The past has been interpreted in terms of itself. Furthermore, information concerning humans in their relation to the world has been gathered and interpreted as if it of itself alone had any importance. It is too often overlooked that this information itself enters human experience and serves to modify it in the terms in which it is gathered and given. The information behaviourists gather and impart as to the behaviour of infants, for example, has certain effects on the manner in which infants will be reared. Knowledge is incomplete if this knowledge does not involve knowledge of how it enters new situations and functions in actual processes of remodification of experience.

In the organic and lower animal worlds this process of reliving the past in the actual present, and of moulding the future on the basis of it, is negligible enough. But with the advent of mentality and communication this aspect of behaviour acquires vast importance. It is well known that ideas, thoughts, emotions, and all that we call mental activity, have become a world in itself to us, in so far as our behaviour is concerned. And in this world in so far as it is purposive and directed, past and present and future are organically tied up. Present activity is determined not only by what the immediately present actuality demands but also by what has gone before and what is expected to happen in the future. The past thus becomes alive in the present, and both past and present suffer reorganization in terms of what is reasonably presumed to come.

Nothing could be more inexact, therefore, than to consider the world of ideas and thoughts as independent from this constant process of change, as existing and not as participating in actual discourse, and being changed at every moment of that discourse. To ignore this fact is to misinterpret completely the actuality of experience. Directed change is an absolutely essential characteristic of experience, and the contents of experience, the stuff, is not indifferent to it. One cannot view the contents of experience in isolation from the process of experiencing. One can view them only as changing, as becoming with the process, and consequently one must consider the aspect of becoming an intimate part of the methodology of sciences that concern themselves with human phenomena. The dissociation here is just as impossible as the abstraction of form or extension in speaking of material things.

If events and processes are the only patterns in which life runs and is integrated in all its fullness, and if furthermore, only processes can include all the vital aspects of life, it is evident that events form the only gateway through which the knowing function can pass on to the analysis of life and all that concerns life. The process of experience is behaving, but behaving conceived in a wider

sense than we find in current practice. Behaving is not exclusively a function of human organisms. It is not to be conceived as only a one-sided human reaction to an outside world viewed as static. Behaving is a process which is a function of both the human being and his environment, inner and external. Human behaviour is not merely a passive response to external stimuli. It is not only an active inter-relation of stimulus and reaction to the stimulus but it is also an inter-relation of these two with a third element—namely, the reaction to the deposits of previous activities, previous reactions. The reaction itself thus enters as an element in the process of behaviour, which then selects and often creates a new stimulus. Consequently, the stimulus is not the primary and independent determinant of behaviour; it is itself determined by that process. Things become things, objects become objects, only when they are reacted to as things and objects. Therefore it is imperative that they be approached in terms of human reactions, that is, in terms of the behaviour act.

It is unfortunate that our conceptions are so much coloured by the pernicious dualism of subject and outside world. This colouring makes it almost impossible to state accurately the character of the functional relation in which both these sides—the subjective and the objective—enter, and from which they are derived as secondary, as a means to classification and discrimination. Experience is the only concept more or less adequately expressing that essential functional relation without intimating a strong bias towards either the subject or the object side. Yet even this term has to many grown to mean something dualistic, something substantial, something that the subject has or does, instead of expressing a relationship that is above both subject and object.

The necessity of approaching experiential phenomena in terms of human reactions becomes still more evident, when we leave the experiential process in general and concern ourselves with specific experiential acts. To know anything about any act of perception, thought, or

feeling, some kind of expression, some kind of reaction, is necessary. That is, only through expressions in active behaviour can we discover how or what a person perceives or feels or thinks.

But in behaviour we may discover not only the *how*, the purely subjective side, but also the *what*, the reference to the objects outside. Both of them have equal importance and both of them should be given equal weight. With this approach to experience we see that the subject or mind is not the sole artificer of experience, nor is it a mere passive recipient of stimuli. It fulfils an intermediate function. It serves as a mould, passing through which, and under the influence of which, events become articulate as objects, meanings, signs or forms. These appear as processes and not as existences, and the more deeply we analyse the contents of these processes, the more we find them consisting of lesser and lesser processes and not of mere substantial elements.

A subject separated from an object, and thus also separated from the original interactive function, is but an abstraction, and it is better to consider it as such. Subjectivity can be spoken of only because there is something on the opposite side that we call objectivity, and because both of them are in constant interaction with each other. " The word ' environment,' " observes Whitehead, " means those other actual things which are ' objectified ' in some important way so as to form component elements in our individual experience."[1] Environment is a collective name for those objectifications brought about by specific dynamic relations.

This functionality of both subject and environment on equal terms, and especially the aspect of change in both poles of the relation, has often been misinterpreted. It has been presented in a way to represent the object part, the environment part, as an unchanging element to which the subject part adapts itself. The ordinary conception of environment runs in patterns of fixed entities. Although a general remodification of the physical environment

[1] *Symbolism : Its Meaning and Effect*, p. 18.

by humans has been admitted, in the analysis of any specific behaviour act—especially in the stimulus-reaction situation—the fixity of the stimulus part invariably has been postulated. In more subtle logical implications of the traditional notion the environment *exists* but it does not *become*. Yet in fact what we conceive as environment in a general or in any particular sense is not determined by what exists actually but by what is conceived of as existing actually and is reacted to as existing. If we were to analyse the traditional conception of environment we should eventually arrive at something that cannot be called environment. If the analyst is a scientist, objects will dissolve themselves into light waves and their mathematical relations, and the observer's reactions to them will be determined accordingly. In the case of a non-scientist, " when sound-waves impinge on his ear he moves, not in accordance with a mathematical equation involving the physical measure-numbers of the waves, but in accordance with the *meaning* that those sound-waves are used to convey."[1] In this case not the sound-waves but the meaning that the sound-waves convey is that person's environment.

Or to take another example in which the analysis is not carried so far from ordinary experience, let us consider the case of a spider hanging on its web. A strong noise is produced and the spider drops. The sound is repeated and eight times the spider drops ; the ninth time it does not. The explanation given by our current psychology is that although the spider, according to that law of learning called learning by repetition, should have really learned to drop every time the sound was produced, it did not continue doing so because dropping was annoying. Here all the artificial machinery of explanation is necessary because in the analysis of the spider's first reaction the stimulus was conceived in terms of what supposedly existed from the spider's point of view but which actually was the product of the point of view of the psychologist. It was not in terms of something evolved in the spider-noise

[1] Eddington, op. cit., p. 271.

situation. The stimulus was noise, and reaction to the same stimulus, noise, was first dropping and then non-dropping. From the point of view mentioned above it is not logical that the same stimulus should evoke a different response. If, however, the same stimulus is conceived in terms of the spider's behaviour the situation changes. Then we might offer the following explanation: The first stimulus was not just noise but "approaching danger" or something of this sort in some very rudimentary sense. The fact that the danger did not appear gradually changed the stimulus and it became something to which the activity of dropping was no longer a necessary counterpart.

We are not responding to a static environment but to a changing environment, changing through the very process of our responding to it. The environment in which the experiential act takes place is never twice alike. It is granted, of course, that there are different degrees of change and stability of environment. In the case of the organism capable of only a small variety of responses, physical nature is more predominant in the formation of its environment; and physical nature is much more stable as an environment than the cultural environment in which man lives. In the human environment also there are instances where the specific reactions are so established that one has a right to speak of a fixed environment. But as soon as we move into the mental sphere, that notion of environment requires a considerable reconstruction along more dynamic lines. In that respect we can almost accept the statement that while the animal takes the environment as it is, man largely creates it.

The foregoing discussion has given some indication of the intimate relation existing between things and their meanings. So intimate is this relationship and so genuinely identical do the two things appear to be that usually we do not discriminate between them. There seems to be reason enough for not separating them, at least not for the purposes of a preliminary analysis. For the sake of clarity and the productivity of thought it is

helpful to start with the assumption that our perceptual images are not copies of things but *are* the things of our environment. Many recent psychologists have advanced the view that perception does not give us copies of things, but forms the actual things of our environment by incorporating sensations and the meanings they may involve. The Gestalt psychologists thus deny the possibility of objects as elements of experience before the sensory experience has been imbued with meaning.[1] The same viewpoint is expressed by Dewey when he says that " if by sensation is meant not a mere shock of feelings but something qualitative and capable of objective reference, then sensations are but one class of meanings."[2]

Viewpoints such as these will do much to break down the predominance of the single stimulus in psychological thought. If we approach the question of stimuli in the light of our knowledge of active human discourse, we will see that there are no simple stimuli as such, because simple stimuli are not responded to. Only those which are parts of relatively complex situations, and which therefore fall under the heading of meanings, are capable of evoking active response. The classification of things and their meanings as two different categories is a product of abstraction and reflection. In our macroscopic experience there are no such sharp distinctions. Piaget's[3] experiments with the thinking of children under nine have shown that children absolutely do not discriminate between things and their meanings ; and to a very large degree this is also true for adult experience.

There are obviously two kinds of meanings : the immediate meanings and meanings in a logical sense. The latter are the result of logical reflection and generalization, and thus are more easily discriminated from things. But that does not mean that they form a class that is in any way radically different in essence from those immediate meanings of ordinary macroscopic experience. They are

[1] Cf. Köhler, *Gestalt Psychology*, p. 72.
[2] *Experience and Nature*, p. 326.
[3] Piaget, J., *Judgment and Reasoning in the Child*.

only results of more critical reasoning and wider testing, including a wider range of experiential events.

Meanings are dynamic, in the sense that they are a result of an active, shifting relationship within the experiential situation. They are produced and remodified in every act of experience. On the other hand, they enter as active participants in determining the processes of experience. To use John Dewey's expression: "Meanings are modes of natural interaction."[1] On the human level that interaction is called behaviour, or, in a still wider sense, experience. In the course of that behaviour process or experience, meanings undergo a constant remaking, because they integrate in their inner structure the deposits of all events of experience. Consequently, every new experiential event is contributive to the original meaning.

Meanings interpreted this way could be classified or termed as objective because they are capable of objective reference. The reason why many psychologies have barred meanings from their systems is that they have been considered as purely subjective and therefore incapable of being treated scientifically. If meanings are not regarded as the private property of somebody's brain or consciousness, but as something expressed and realized in observable behaviour as the result of the inter-behaviour of men, then they are to be regarded as objective. And by becoming objective they become facts of experience. It is true that some meanings have a subjective history, and to the degree that they depend on that history they are subjective. But as far as such a meaning enters and affects observable behaviour, that subjective history can be followed and accounted for. Meanings can be treated scientifically. Furthermore, the subjectivity is not confined to meanings alone. Objects and facts suffer from the same type of subjectivity, though generally not to the same degree. Fortunately, even the most subjective types of meanings point towards their origin as soon as an unbiased analysis is applied to their functioning in experience.

[1] *Experience and Nature*, p. 190.

With this conception of the relation of objects, meanings and the role of perception, the difference between real objects and phenomena, so dominant in present psychological literature, disappears, and the notions of symbolism and concepts gain a new meaning.

It is impossible to perceive any object in "its actual fullness." To be able to do so would mean ability to respond to the object in every way possible, ability to integrate all the possible meanings of that object. It would also imply that the possibilities of different responses that can be made to any given object are limited and fixed, and that no new situation could possibly bring out any new qualities and relations in it—a supposition that is neither true nor possible. Our experience in all its aspects is necessarily symbolic, because it is always partial.

This also reveals to us that the category under which the interaction between subjects and things takes place is not causal, but symbolic. Our perception follows a symbolic relation rather than a causal one. We perceive but a fragment of potential reality, only a sign, and that sign may under other conditions point equally to other things, to other events, as well as to other meanings or to past connections. This pointing does not discriminate between the existential and the ideal, between the subjective or objective. These discriminations can be made after all the pointings have been followed and tested. "The field of consciousness is the field of symbolic events," says Hollingworth. "To think of an event is to be in the presence of some detail of that event, which functions red-integratively in the subsequent flow of events."[1]

Hollingworth conceives symbolic relations chiefly in a sense of present detail functioning for the past. Thus the symbolic pointing would be done only towards the past. But there is possible a much wider interpretation of the symbolic reference. Any element of perception functions as a sign for all possible different meanings, and those

[1] *The Psychology of Thought*, pp. 188-9.

meanings depend on the response patterns that are called out by that symbol. Thus Whitehead asserts that all perception is some kind of symbolic reference in the sense that the experienced thing refers to something beyond that is really given in the sense data. This particular reference is created in any single perception through the functional relation of subject and object. Every single experience is shaped in the very process of experiencing according to the particular state or attitude the experiencer is in, and according to the relation to the experience-object in which he finds himself. One sees a brown patch of a certain shape and interprets it as a chair. An artist through training may ignore the chair aspect of it and conceive it only as a patch of beautiful colour and shape. Also, if the brown patch is near enough it may be experienced as a chair, yet if it is at a distance it may remain only a brown patch. And according to the particular situation the chair may mean something to sit on, or something to be pushed away from one, or something to be used for decorative purposes in a room.

This example of Whitehead's makes clear how the meaning or the symbolic reference necessarily is explained or described in the terms of the responses—to sit on, to push away, to decorate the room. And in relation to each of them the thing is conceived slightly differently.

Whitehead's position regarding symbolism as a mode of experience, however, cannot be fully accepted because it presupposes a dualism of subject and object. His presentational immediacy is a relation between subject and object as pre-existing to the experience itself. The content of the symbolic reference is for him determined by pre-existing characteristics of subject and object.

Symbolism as a mode of experiencing cannot be dualistically predetermined to the degree that the experience itself is not predetermined dualistically. Symbolism is the intimation of a dynamically individual shade or quality of things or of events as parts of a total, but unique situation. Thus, for instance, we can conceive of " book " as an object quite well defined and

unchangeable as to its content. But " book " for a bookseller is a commercial object, for a student a treasury of knowledge, for a *nouveau riche* something to fill his elegant bookcase with. These specific contents of the general idea " book " are derived from specific relations of the subject and object in specific situations. The response to " book " is in no case made to the notion of " book " in general, but to the specific notions fostered by specific situations and relations. These specific contents are at once determined by the relation of the individual and the book, in past and present experience, and they determine the future responses of the same individuals. The *nouveau riche*, who considers a book as a decoration, is less likely to open it for the purpose of reading than is the student. Thus symbols being themselves products of experience, also become the carriers of future experience.

What has been said of symbols and symbolism is also in general true of concepts. Symbols are intermediatory between the fullness of actual experience and the meagreness of conceptual generalizations. Apart from their difference in generality and exactness of logical contents, they are functionally the same. They carry behaviour from the given actual situation to the past and to the future, to other objects and meanings not included perceptually in the present situation.

Both symbols and concepts are levers which carry experience out of the limitation of sensual experience. They are both means by which the isolation of single experiences is overcome, and which, therefore, help the dynamic reorganization of human experience.

Concepts are the forms of intellectually articulated experience. They belong to the type of experience where events and their qualities are classified and systematized.

Concepts are related to human experience as formulae are related to physical phenomena. They are catching something dynamic in a more or less static and representative form. But unlike physical formulae, concepts in human sciences do not stay indifferent toward the events that they represent. They become events themselves,

and are capable of being responded to on their own account. They become parts of environment. Our concept of honesty is not only a representative and collective formulation of all honest acts; it also determines which acts we are going to regard as honest in the future, and in what manner we are going to act in a certain situation. This would naturally include situations that were not included in the previous formation of the concept "honest." Consequently, in order to keep the intermediate position of concepts, and at the same time do justice to the ever-evolving situations, we must keep the concepts in constant relation to the perceptual plane, and not let them grow rigid as fixed, unchangeable formulae.

IV

The conception of experience as developed in the foregoing, has some important bearing on the method by which this experience is studied. As was brought out in the first chapter, there is an intimate connection between subject matter and an adequate method of its study. A certain type of subject matter demands a certain approach and certain tools of study. The static outlook developed a method that was suitable for the subject matter as defined by this outlook. It is time for the dynamic outlook to formulate its own tools of research. So far the analysis which we have referred to here as the static analysis has been the main tool for any research considered scientific. This method was formulated by certain basic assumptions resting on the foundation of the static, discrete elements considered as reality; and that method in its turn served to maintain and reinforce these same basic assumptions. Around such fundamental presuppositions the whole structure of research was, and to a large extent still is, built. The presupposition that reality is composed of discrete elements and that there is nothing in nature as a whole but the combination of those elements, has produced a method of research that aims at what one might call the photographing of life. This

method ultimately gave as a result a static, cross-sectional picture of life. The static and atomistic approach and their corresponding methods were not able to cope with those aspects of life and experience that are characteristics of larger functionally interdependent and changing wholes, and that do not manifest themselves in any isolated processes or existences. They dealt with the logically elemental aspects of life and experience.

Analysis is one of the chief tools of scientific investigation. We find it applied in two forms: structural analysis and functional analysis. The first type has been defined as " any kind of analysis made when the conditions of investigation are so selected as to reduce the complexity of the object or event under consideration."[1] The same author has described functional analysis as " the procedure of varying the conditions under which a phenomenon occurs in order to ascertain what conditions are essential to its existence."[2] In the first case, however, reduction of the complexity of an object or event is not the sole aim; it is, in fact, the means and not the end. Reduction of complexity, too, may also be the tool of functional analysis. A more important difference between the two types is that structural analysis is seeking the existential, the contentual elements of a given phenomenon, while functional analysis is seeking the functional inter-connections of conditions and effects, the functional inter-relation of processes within the given event. In structural analysis the phenomenon studied is conceived as an unchanging unit, at least during the moment of study. In functional analysis the unit is treated as a whole in the process of change. Structural analysis acts through splitting. It seeks simpler and simpler components of a substance of the phenomenon considered from an existential point of view. Functional analysis works through the functional varying of conditions, but keeping the whole (including change itself) intact.

[1] Wheeler, R. H., *The Science of Psychology*, p. 13.

[2] Idem, p. 12.

There is no hard and fast line between the usage of either form of analysis. Frequently specific discriminations are made through functional analysis, while the setting up of the major problem has employed structural analysis. In such a case the study really has the defects of structural analysis.

The inventory method of structural analysis has been able to grasp only the existential aspects of reality, so much so that it often appears that only these aspects have had any interest for science or scientific method. Life, however, is never at rest. The greater part of it—and the most important aspects in so far as control and foresight are concerned—is in a state of formation, of becoming. Those patterns of life that have steadied themselves belong to the past. Their influence now is only indirect, and even then only to the extent that they become alive in present active patterns of events. These steadied patterns are thus important only in so far as they enter as participants in active processes, in becoming.

What is vitally important in the understanding of the phenomena of life is found in the dynamic inter-relations of events, their compelling successions. It is not so important for us to know that consciousness *is*, as to know what it *does*. We should not be so interested in what mind is as substance (whatever this may supposedly mean) but in how it enters into the direction of our behaviour.

Structural analysis proceeds by dissection. It was stated above that a full knowledge of the elements composing a whole does not render a complete understanding of that whole. Still less capable of instructing us about the functioning of the whole is a complete knowledge of the structure of its component elements. It is because of this direct dissection involved in most analyses, that Gestalt psychology has objected to analysis as the main tool of scientific investigation. Gestalt psychologists hold that the analytic processes used in natural science and in psychology patterned after such science is comparable to the actual dissecting of the biologist or the partition of the physicist, and as such it severs the natural

" wholeness " of phenomena belonging together. They also hold that analysis that pays sole attention to elements and none to dynamic inter-relations is disregarding some very vital aspects of psychological phenomena.

This position of Gestalt psychology is often interpreted as a rejection of analysis of any type. This is not true. In order to see experience on a functional basis it is not necessary to ignore analysis as a tool. It is necessary, however, to supplement the structural analysis with a type of analysis that is able to discriminate without dissecting. We need to know about the partial functions and elements that make up a whole, but we can know about them completely only by understanding them in their role of participating in the whole. We can have an adequate conception of them only when the organic ties that connect them functionally to the total in which they are active are not severed. Thus, in order to understand what role the concept of honesty plays in the behaviour of seven-year-old children we need to know the type of thinking of seven-year-old children in general ; we need to know the inter-relation of the intellectual with the emotional aspect in behaviour ; we need to know what the directives in the behaviour of children are ; and so on until we possess a complete enough picture of the workings of the child's mind in relation to his behaviour in general. Only then are we ready to observe the child's behaviour in relation to the specific concept honesty. A detailed analysis of specific sense perceptions, emotions, nervous currents, and glandular secretions in connection with the presentation of the concept honesty does not by any means tell the whole story. Such a study neglects the meaningful and the inter-relational aspects of behaviour. Though we cannot deny the importance of knowledge concerning such specific facts underlying behaviour, the most important consideration is behaviour itself, its inter-relations, its causal sequences, and its conditions in dynamic and ever-varying life situations.

The importance of possessing a correct usage of analysis is increased by the fact that analysis is not only a tool of

investigation but it also has its influence in the discovery and statement of problems to be studied. Which problems the investigator is to pursue usually depends largely on the results of preliminary analyses. "The analytic attitude changes the thing of observation, the natural datum into another one more poorly structured," says Koffka.[1] If this is so, observation following the customary structural analysis is led to deal with much more poorly structured data, is led to form its problems on the basis of partial and not of full, complete data. And in this connection it is undoubtedly true that present psychological and educational research is justly criticized for too often neglecting the more important phases of human behaviour in its devotion to details that can acquire significance and meaning only in connection with those more important phases. Giving due consideration to the limitations imposed on experimental work by the human sciences in general, this deficiency of approach and results is primarily due to the employment of the methods of structural analysis as the predominant type of tool used in research work in this field.

There is another kind of interdependence that remains undisclosed by structural analysis. The inter-relations revealed through structural dissection are more or less local in so far as time is concerned. Structural analysis points to relations present at the time of analysis. But the phenomena of experience are patterns of occurrences that very often realize themselves over much longer periods of time than those covered in these analyses. Their inter-relations point toward events in the past and events in the future. Consequently, a mode of analysis unable to view these inter-relations involving time is also unable to grasp those patterns only partially present at the moment of study, those patterns which are, we might say, in a state of becoming.

In order to give a more adequate picture of actuality, then, analysis should be able to grasp not only the local and elemental but also the supra-local and supra-elemental,

[1] "Perception," *Psychological Bulletin*, 1922, p. 539.

should be able to compare aspects which are separated by intervals of time and space. Little prediction, even little understanding of human behaviour, is possible from the study of only one act, or even of several acts separately considered. A real understanding can come only if the sequence of behaviour acts is regarded as actually happening in its continuity. There are some tendencies, some patterns, that are visible only in a temporally extended whole, in that wider pattern of which no trace is to be found in any isolated reactions or even in a local, single meaningful act. Thus, as is frequently recognized despite the prevalent analytical methods of study, the disobedience of a child in school may have its roots in some events in the past which did not manifest themselves as acts of disobedience; and the relation of these to the present can be discovered only if the wider behaviour of the child is analysed in its developmental aspects as well as in the inter-relation of all acts to each other.

The second major methodological implication of the notion of becoming lies in the circle of problems concerning the ultimacy and objectivity of facts and experimental data. The atomistic and static outlook planted its main faith in the elemental, while ignoring the relational and functional and supra-local. Thus facts, as isolated data, were regarded as irreducible, ultimate and self-sufficient for their own objectivity. "Facts" have been for the physicist and also for the "scientific psychologist" the ultimates from which there is no appeal; they were held as sufficient criteria, as the proof and test of any theory or hypothesis evolved from them. Our age is not incorrectly called a "fact-worshipping age."

In general this relative ultimacy of facts is quite justified. The question is rather one of what kind of facts are to preponderate in this connection. The proponents of the static outlook apparently were not aware of the "fact" that in the humanistic sciences at least there are no "pure facts"—no such phenomena presented nakedly to the mind. Nor are conclusions imminent in a set of "facts." From the same set of "facts" one may draw several

conclusions—which throws some suspicion on the ultimacy of facts.

The truth is that facts themselves are the result of interpretations and general preconceptions. Facts are not ultimate; they are facts on different occasions. Facts are interpretations. And finally, facts are facts only in their inter-relation with other facts.

Facts are the product of analysis and observation—but it is seldom realized that both these methodological functions have been directed by the metaphysical or other preconceptions and biases thus far prevailing, and by the very theories to the validity of which the facts are supposed to contribute. This matter of guidance is important because facts are not independent of the hypothesis by means of which they are found and in the light of which they are examined. Facts are derived from an analysis of experience, and this is done in the light of the principles of current judgment. Our knowledge of facts goes hand in hand with the development of theories and with the development of the method for finding facts. A misdirected theory or a shortcoming in a theory is unavoidably reflected in the nature and the validity of the facts brought to light by such theories. This seems to be particularly true in the social sciences. Lindeman maintains that the social sciences have given no fruitful explanations of sociological phenomena because they have not as yet developed the method for discovering the pertinent facts.[1] To state this in other words, the social sciences have not discovered their facts because as yet they have developed no adequate methodological theory of their own. The result has been the experience common to all having anything to do with the problems of the social sciences—different facts about the same situation are advanced by parties holding different opinions and beliefs. The facts involved in any social problem are usually too numerous and elusive to allow an exhaustive presentation of them, and the selection made is always influenced by the theories held by the observer or by the

[1] *Social Discovery*, p. 4.

purpose governing his investigation. Consequently, in the evaluation of the pertinency or accuracy of facts in these fields there is but one way to objectivity, namely, evaluation of facts in relation to the theory they belong to and in relation to the method by which they are obtained.

The majority of those things we call facts are not existentially given, they are the result of selective analysis, of interpretation and generalizations; therefore, they are not self-explanatory. . . . "There are no brute, self-contained matters of fact," observes Whitehead, "capable of being understood apart from interpretation as an element in a system. . . . Every scientific memoir in its record of the 'facts' is shot through and through with interpretation."[1]

There are undoubtedly facts that are easily proved experimentally and quite evident to any observer; as, for instance, that a certain village has a certain number of inhabitants, or that water freezes at a temperature of 0° Centigrade. Yet there are other facts, such as those represented by statements that learning is analytic, or that the United States is democratic, that involve a high degree of interpretation and even—as all the facts never are available—misinterpretation.

Facts need to recruit each other in order to supplement each other before our knowledge of any one fact is complete enough to pass for truth or objectivity. We well know how the geocentric world picture, the Ptolemaic revolving planetary system, the location of a heaven above and a hell below, were all (originally) tied up with one fundamental notion considered as fact: namely, that the earth was flat, a notion in this case derived from experience, but experience that was too limited. So, too, it is interesting to observe how many facts in present educational theory depend upon the hypothesis that behaviour is fundamentally based on discrete units of stimuli and responses. Here the facts share the limitations of the hypothesis held, and as such represent but a limited and partially weighed set. Some facts, indeed, are not

[1] *Process and Reality*, pp. 21-2.

observed because they do not fit the adopted theory governing the research and study.

This brings us to the third consideration, namely, that facts are facts only in their relation to other facts. They are not self-contained and explanatory; they are system-contained and explanatory within their systematical interdependence with other facts. A fact out of its relation with other facts is no fact at all in so far as its explanatory value is concerned.

With all these points in mind, it should be evident how easily the objectivity and "ultimacy" of facts can be over-rated, how easily a partial set of facts can be passed for complete data. There will always be some limitations to our knowledge of actuality and to that degree "facts" will always lack complete objectivity. Consequently, it is helpful to any investigation to consider its facts not as ultimate and complete, but as tentative in more or less greater degree.

But there is also another reason why any set of facts should be conceived of as tentative, and that is that facts very often make other facts. In the field of the social sciences especially, facts influence further behaviour and that further behaviour in turn produces new facts.

The "fact" that workers are the main productive force in industry, if made known, tends to change the attitude of workers towards their work and their employers and their wages, which change in turn is able to produce changes in the actual relations of employer and worker, not only in economic theory. In the social sciences the knowledge of certain facts has an immediate influence on social events. Therefore, the interpretation of facts in this field has a profound importance, as it has a direct bearing on the course of events.

The scientific trend in the social sciences has been chiefly responsible for the quantitative treatment of data. Measurement, strictly controlled experimentation, and statistics have been regarded as the most valid methodological tools, seeing that they produce results that are apparently exact. It is true that they are exact as far as

they go, but only as far as they go. The interdependence of facts and data with the general hypothesis held by the investigator, as brought out above, shows that this type of exactness is limited by the shortcomings of the governing theory. A particular, accurately-measured set of facts can be very exact within the limits of the theory held, but it shares the limitation of the theory. If the theory is inadequate the data collected within that theory are inadequate also.

The quantitative treatment relies on certain fixed techniques. Techniques can be worked out only for the treatment of those phenomena that repeat themselves, that show a large degree of recurrence and stability. But life's phenomena are changing and evolving, and consequently it seems inadequate to deal with them with fixed techniques only. Their adequate understanding calls for fresh judgments in addition to technique. Köhler has pointed out repeatedly that quantitative treatment needs qualitative analysis as its basis, and that in some cases qualitative analysis, though its results do not show any exactness from the strictly technical point of view, may be not only more adequate but also more accurate. The quantitative measurement is truly valuable only after qualitative observation has given us primary orientation. Quantitative measurement is justified after hypotheses have been formed on the basis of primary qualitative analysis. Measurement is usually applied to specific aspects, but there are elements in any situation to which measurement is applied which refer to wider relations. Measurement can be applied only to recurrent aspects, but as life situations are evolving and changing, there is always something that defies technique and needs judgment on the spot for its understanding. Therefore measurement without such judgment is blind.

There are many cases of experiments and measurements performed in vain because the underlying processes and inter-relations of processes have not been adequately analysed. A typical example may be found in child psychology. The child's thought and behaviour are

interpreted in terms of adult thought and adult categories, only simplified. No amount of measuring will bring us nearer to accurate knowledge of the child's thought so long as we fail to realize that the fundamental types of it cannot be found by such terms, but only by unbiased, qualitative observation. On the basis of such observation we can form the categories under which the child thinks, and only then can we measure it quantitatively. Observation is a tool of such qualitative analysis.

Observation has been decried by scientific psychology, because the process has been characteristic of speculative introspection, and carries with it the suggestion of subjectivity. Yet observation, when the conditions under which it occurs are such as to eliminate subjective bias, has a very important mission in the system of scientific investigation. For one thing, it enables us to view a larger field than the so-called exact measurements are capable of covering. By observation it is also possible to notice those aspects of the studied phenomenon which are not called for by any pre-arranged technique of investigation, including those that may develop during the process of investigation itself, to become added factors in the situation.

Because of its inherent inaccuracy, observation can never fulfil all the demands of a scientific analysis, but it is indispensable in the stages of investigation where the hypotheses are being built and the techniques for more exact later investigation are being worked out.

Observation, too, being more plastic, is a necessary means of keeping scientific investigation in step with the dynamic onward march of the events of experience and life. It serves to forestall the stagnation and ageing that the stability of techniques eventually provoke.

CHAPTER III

PRINCIPLES OF BECOMING

I

IN the preceding discussion our examination of animate and inanimate phenomena has shown us that the essence of all phenomena is to be found not in material, substantive, or any kind of static existentials, but in dynamic processes. Interactive processes, we found, are at the basis of the physical as well as of the organic and human worlds, the latter differing from the former by the aspect of cumulative change that has been termed " becoming," as it is directed and irreversible. Because of this difference, an adequate study of organic and human phenomena demands a methodology constructed so as to enable the investigator to view those properties and qualities of these phenomena which emerge and manifest themselves chiefly in processes and inter-relations, and which are not statically final, but are becoming in their nature.

The methods of study so far applied to human phenomena have been either implicitly or explicitly static and atomistic. They have employed concepts and tools of investigation which are intended to discover final, ultimate elements only, neglecting those aspects of actuality that are not the direct qualities of such final, atomistic elements.

The dynamic approach to organic and human phenomena emphasizes change. Following the hitherto dominant philosophy, change has been usually associated with disorder and unintelligibility. That this is not necessarily so we shall endeavour to show in the present chapter. Here an attempt will be made to bring out some basic concepts and ways of thinking about such changing and emerging phenomena of human experience that will assist in the formation of a consistent picture without attempting

to force these aspects into the rigid structure of a closed, finalistic, scientific scheme.

Scientific systems are primarily explanatory systems. Their value lies chiefly in their ability to further intelligent understanding of the world we live in. This they do by rendering a unified outlook on a great variety of phenomena, by giving an adequate basis for criticism of facts, and by moulding our thought into methodological channels that make possible consistency in hypotheses and in the methods of treating data.

Sciences have always striven toward clear, unified systems. This aim has been achieved by postulating or discovering some reliable uniformities and regularities in manifold phenomena which would serve to force a diversified universe into a rigid framework of laws and rules.

Such laws and rules concerned themselves mainly with things already become, with stabilities and recurrences. The notion of strict law as developed by the exact sciences, is hostile to change in the sense described in the preceding chapter. Scientific laws, as well as cause and effect relations, presuppose strictly predictable change, which change does not involve any change in the essentials.[1] Laws are rigid and exact in their nature. They are supposed to exclude any element of uncertainty and inexactness, these elements being quite contrary to the ideal of the "scientific" sciences.

Scientific laws, to be sure, introduced order into our schemes for understanding the world about us and within us, but they did it by setting rigid limits to our picture of the world, and by excluding everything that did not fit into that picture. It was a picture based on the assumption of a limited number of final unities, final elements, constructed by a shuffling around of such entities. Order came to mean prefixed, stable arrangement, arbitrarily excluding all that was transitory or unique or changeable.

The dynamic viewpoint demands a revision of such a picture. It requires a system in which intelligibility and

[1] Knight, in Tugwell, R. G., *Trends in Economics*, p. 243.

consistency are not of necessity achieved by excluding those aspects of actuality that do not show the characteristics of finality or uniformity. In other words, it questions whether order necessarily means recurrences, exactness, stability, finality. It asks whether a different standard should not be applied to our systems of explanation. It believes that an intelligent understanding of changing phenomena will reveal serviceable regularities and consistencies and will render intelligibility to the system of rational understanding, without doing violence to natural properties of actuality.

The traditional notion of laws and order is fallacious in many respects. One of the fallacies lies in the belief that laws are ultimate, final, and exact formulae of actual events or phenomena. These laws are conceived of as having been "discovered," not as having been constructed by human effort in the desire to create systems. To these laws the characteristics of ultimacy and finality have been attributed.

A closer investigation of the nature of so-called fixed laws reveals that there is no reason to think that any set of laws presents an exact picture of how things really happen. Laws are completely dependent on the sets of facts available and on the types of observation possible. Reality, especially a becoming reality, is too rich in possibilities to warrant any belief in an exhaustive knowledge of it. New tools for observation discover, and at the same time introduce new sets of facts, and these require a new set of laws to deal with them. Such a revision of laws long held as final has occurred repeatedly in the history of science, yet—until recently—without having shaken the faith of scientists in the finality of laws themselves. The ruling ambition of science still is to "discover" a final set of exact laws to serve as exact formulae. The validity of its laws—as expressed chiefly by their exactness—has served as a standard by which the scientific value of any discipline has been measured, and by which the acceptance or non-acceptance of a discipline into the family of sciences has been decided. The

inability of human sciences to "discover" a set of laws conforming to these demands has been the reason why there is so much doubt and argument as to the scientific nature and value of these studies.

It seems reasonable to think of laws as working tools, the product of human construction, which fit and systematize our observations, the validity and usefulness of which can be measured by the degree they render unity and clarity to the diversity of single facts and single processes. In fact, it is now among exact scientists themselves that we find expressed the view that our present laws are nothing more than the expressions of a system of our own construction, built for our own satisfaction and our own sense of security; and that we might have built just as easily in some other fashion and have discovered some other laws in the process.[1] We are justified in believing in the usefulness of natural law because we can find no tolerable alternative, although there is no reason for thinking in so far as finalities are concerned the law we have chosen is more probably true than false.[2]

Laws being of our own construction, it is evident that they share the limitations of our knowledge, and therefore are far from presenting an absolute, final picture of natural events.

Still less reasonable is the claim to their absolute exactness. A sort of numerical accuracy has been postulated as the sole standard of scientific thinking, largely because the quantitative tools of investigation in the exact sciences have rendered the numerical accuracy fairly convenient and also because it is satisfying to the natural need for clearness and simplicity. Thus it was so easy for the atomistic viewpoint to conceive of reality as a quantitative re-arrangement of a limited set of final entities and to manipulate them numerically. Other sciences less adapted to the use of numerical measurements have uncritically accepted the same standard.

[1] Cf. Eddington, *The Nature of the Physical World*, p. 241.

[2] Ritchie, *The Scientific Method*, p. 85.

There is no reason why phenomena of different character should not be systematized in ways more suitable to their peculiar characteristics, stressing adequacy in preference to numerical exactness, and still be exact in a more general sense, that is still be able to render an accurate account of actual phenomena. Phenomena are not made any more exact by numerical manipulation. It is necessary to express the subject matter in terms of laws suitable to, and best expressive of its character, granted that the system as a whole fits intelligibly together and does not blur further vision in the same field. To subject a description of phenomena to the standards of exactness and finality when they do not possess those characteristics, is to import something into the system that is alien to the phenomena themselves. Such a process hampers further productivity of thought.

It is evident that in dealing with phenomena, the basic characteristics of which are not recurrence and stability, much less exactness, it is imperative to employ a standard of scientific validity different from that used for phenomena possessing such aspects. Finality and uniformity should not be sought for their own sake but for the sake of clarity, consistency, and unity in treating the phenomena under consideration. Our thought, in order to be productive, adequate, and satisfying, requires some central idea to serve to unify the diversity of reality, or a central way of looking at things to enable us to see relations among the variety of phenomena. And a system of thought may just as well be built on the basis of the continuity of events as on the basis of a pre-arranged framework of stable recurrences. Yet from the standpoint of the dynamic universe, the latter is preferable, because it brings order and consistency to thought without limiting its specific contents and without doing violence to certain phenomena of life.

As it is now, or at least, as it was until quite recently, all phenomena which exhibit the characteristics of becoming are essentially excluded from any scientific systems. The situation is precisely the same as described

above in connection with the problem of method. Here again we have the question of whether the nature of events is to be misinterpreted in order that they may fit a standard alien to them and raised on false pre-suppositions, or whether we are to construct laws to suit these events. Since laws as they are predominantly conceived at present, deal pre-eminently with things already become, with the outcomes of events, with substantive and stable aspects of phenomena, and not with the processes themselves, not with change, all events that represent real change in their essentials, are either excluded from any rational treatment at all, or they are represented in partial or distorted form so as to make them fit the laws and rules fixed *a priori* to the events themselves. Laws as tools should keep their functional relationship to the events themselves and should represent change to the same degree that the events do.

With this notion of law in view the conception of science itself acquires a new meaning. Science should not be seen as a mere collection of laws and rules, of substantive and final outcomes of processes of life. It is the methodological aspect of science that should be stressed. It is not the finality of outcomes, but validity and adequacy of method which should determine whether a discipline is a science or not. Science, after all, is mainly a method for postulating and solving problems.[1] It is not a body of facts but a method of precedure.[2] Its immediate purpose is to understand phenomena, not to force a rigid system on them.[3] Therefore its main concern should be to give guidance, to help the understanding, to lead inquiry along the most serviceable methodological avenues, and to facilitate the treatment of bodies of facts by suitable systematization and discrimination.

Modern psychology shows clearly the effects of the effort to subject the study of human phenomena to the structure of the laws and standards of the exact sciences.

[1] Lindeman, *Social Discovery*, p. 23.
[2] Ladd and Woodworth, *Elements of Physiological Psychology*, p. 7.
[3] Knight, op. cit., p. 23.

It undertook to free itself from the yoke of the substantialism of faculty psychology and to reconstruct itself on a more functional basis, to investigate processes, behaviour. But in its anxiety to attain a position among the exact sciences, it strove to "discover" laws which would be exact, which would be final, and which would serve as a basis for exact prediction. As such laws could be "discovered" only in some specific details of human mentality, and primarily in physiological processes, psychology sponsored a detailed investigation of certain very specific functions of the psycho-physical organism. Whatever qualities were ascribed to these specific functions —whether they were called instincts, innate tendencies, or merely nerve currents—they had to be treated in general as isolated, as independent of the total organism. The general assumption was that the study of behaviour is completed when an inventory has been made and a description given, of such partial and isolated functions. The way in which such functions act together so as to form an integrated organism seemed to be outside the field of psychological interest. This was in part due to the enthusiasm over the new factual knowledge gained by "scientific" procedure, but to a greater extent because the pursuit of such larger problems would not resolve the phenomena into neat and compact sets of laws. In other words, psychology did not appear "scientific" when the wider phases of behaviour were studied. It is quite typical of almost any treatise on modern psychology to devote page after page to the discussion of specific nerve currents and isolated stimulus-reaction bonds, and to dismiss the question of personality or of conduct, or even behaviour in its proper sense with but a few vague remarks. A list of the research tasks and investigation problems of a psychological laboratory usually reveals the same unfortunate emphasis.

It is obviously true that in order to know anything about behaviour we have to know all that we possibly can about the specific processes that go to make up behaviour. But it is equally, if not more important, to have an

adequate conception of the functioning of the integrated unity comprising all these constituent processes. And for that purpose an inventory of the specific functions, studied in isolation, is not sufficient, because single processes in isolation are not operating in the same way as they do when they comprise parts of a larger system.

It seems impossible to have an adequate psychology of behaviour so long as the investigation of behaviour is to be artificially and dictatorially confined by techniques and standards borrowed from alien fields. These techniques, coming from sciences that are primarily analytic, ignore the integrative nature of the functions of conduct. Behaviour, conduct, mean unity, and that unity is to be found in the processes themselves ; it is not to be imported from some exterior source. A behaviourist who starts with " a bunch of squirmings " (J. B. Watson), has the same aggregate on his hands after all the machinery of conditionings and other binding factors have been put into operation. No amount of manipulating and conditioning by external situations will render unity of personality to these bunches of squirmings. Nor do mystic forces like the soul, mind, or consciousness (in their traditional meaning) render unity to processes that are not supposed to foster that unity within themselves.

If the conception of specific functions does not include interaction, productive of integration, then only identification and conflict remain as the modes of interaction of these functions. Both of these modes, in fact, are employed quite frequently in psychologies of today, especially the notion of conflict. Both the behaviouristic and the biological trends in psychology have accepted the conflict of diverse tendencies as the fundamental condition and mode of all behaviour. It is even asserted that if there were no conflict, no activity and no behaviour would be possible. It is true that without the existence of diversified and often antagonistic tendencies and factors there would be no variety, no becoming in life. But conflict is not for this reason the only and basic mode of behaviour and life. The conflict of different tendencies

serves as a starting point for new integrations, for new courses of behaviour activity. There is a difference between the conception of conflict as sustaining the activity and between conflict seen as a starting point of activity; conflict, in other words, transforming itself into a new synthesis, into a new harmony. Conflict and the succeeding integration on a new level are two moments of the same process. Progress and development and growth come because out of the original conflict grow integrative and creative forces. If the suppression or annihilation of one or more of several conflicting tendencies were the only possible result of conflict, there would be little room for optimism regarding the growth of personality. Growth and development can be regarded as the result of conflict because there is a possibility of new unified action resulting from conflict. We do not get the supremacy of one tendency over another but a merging of both in a new type of activity.

A certain analogy for these two conceptions of conflict might be found in the picture of two stones rolling towards each other and two streams of water encountering each other. In the first case we have either one stone putting the other out of activity or the direction of both suffering modification. The conflict as a fact remains, and the individuality of the two stones remains. In the case of two streams encountering each other, both of them merge and are taken up in a new stream, different in direction, in size, and in its power to overcome new obstacles. This new stream has absorbed the qualities of both former streams, yet it also has a quality of its own. It can accomplish what the separate streams could not. The analogy, of course, is crude and deficient, as all analogies involving the comparison of organic with inorganic behaviour must of necessity be; yet it conveys an idea of some of the properties of what might be called the integrative process.

There have been several attempts at a reconstruction of psychological analysis on a more dynamic basis. One of the more outstanding ones is to be found in the trend

of the German *Geisteswissenschaften*, as represented by Spranger, Litt, and perhaps Scheler.[1] The aim of this trend is to construct systematic and scientific schemes of the more dynamic aspects of human conduct, without harming either a genuine scientific interpretation or the freshness and dynamics of the phenomena studied. Yet a distinct clinging to the current notions of law, finality, and universality is evident.

Spranger in his book, *Types of Men*, has set out to construct dynamic patterns under which the processes of life fulfil themselves. His " types of men " are structural resultants of dynamic value-relations between the individual and his environment, the character of these specific relations depending on the specific instances. He maintains that structure and law must not be conceived of as something unchangeable and fixed ; he also emphasizes the changeability of the individual person and his dependence on specific relations with his environment. He talks of the dependence of the individual upon the objective structures with which he is in constant relation. The typical subject-object relations are described as constantly becoming, constantly changing, individually differing from any preceding ones.

Yet through Spranger's lines there lurks the notion that law, into which he dissolves the notion of substance, is in some way uniform, in some way inclusively regular, that there is some element in the individual that sets him off definitely against the environment ; this essence of the individual is static—at least, it can be considered as static for the purposes of investigation. Thus the changing aspect of the individual can be overlooked in structural psychology and its study assigned to the specific branch known as genetic psychology.

However, if the functional changes in the individual-environment relationship can be discarded for the purpose of understanding the structure of either of these two

[1] Spranger, Eduard, *Die Gegenwartige Stand der Geisteswissenschaften* ; *Lebensformen*. Scheler, Max, *Der Formalismus in der Ethik* ; *Wesen und Formen der Sympathie*. Litt, Theodor, *Geschichte und Leben* ; *Individuum und Gesellschaft*.

elements in the relationship, the structure naturally achieves primacy over becoming, and change is considered but its secondary accompanying aspect. Spranger is working on the assumption that structure can be understood apart from functioning, and that there is a structure independent from interaction. Thus he attempts to describe human behaviour in purely structural terms. It is evident that Spranger, although endeavouring to construct a system that would " understand " life and not merely systemize it, is able to achieve only a part of his intended task. He fails when he tries to maintain the traditional dualistic and static categories, such as substance existing aside from process, and the notion of the structure of subject and object as understandable outside of their active interaction. The subordination of his general types of experience, such as the economic experience, the religious experience, the cognitive experience, to the abstract and definitely circumscribed ideals corresponding to each type, such as *power*, *totality*, and *truth*, is a genuine expression of the static and dualistic philosophical background and Kantian tradition.

In both Spranger's and Litt's writings there is an expression of a faith that one can take a static cross-section of life for the purpose of study—that one can stop process in order to investigate structure. Their assumption is that structures have an existence independent of functions, and that structures are fully understandable taken by themselves. It is a notion similar to the traditional notion of time—a stream in which things are floating around and out of which one can pull them for purposes of investigation. Structure to such investigators appears to stand as a magic formula that unites life's precariousness and variety in a perfectly static conceptual form, and that nevertheless is able to tell us how things are happening.

This same view regarding structure is prevalent, though not quite so distinctly or incisively stated, in many recent philosophies of a quite dynamic character. Structural concepts have woven themselves too intimately into our

modes of thought to permit the complete success of genuinely functional interpretations.

II

From the preceding it is evident that attempts to understand behaviour from the study of structures only is scarcely justifiable. Behaviour is likewise incomprehensible from the investigation of isolated, bracketed, elementary " constituent " processes. The basic principle of behaviour, we maintain, is interaction, and interaction cannot be adequately described by any static conceptions or understood under any dualistic or atomistic categories. Our real search in human science should be for modes of interaction and for categories that will adequately describe such interaction.

It is ordinarily thought that by substituting becoming events for stable entities the very basis of a rational understanding will be destroyed. Thus, it is understood that without the exactly predictable cause and effect relations there will be no continuity to go by and that by trying to treat phenomena which do not yield immutable laws there will be no methodological guidance to rational thought. In other words, in this point of view a becoming world would be a chaotic world.

It is shown by many investigations which have dealt with becoming phenomena on a dynamic basis (biology, for instance) that becoming, as described in the preceding chapter, is not a chaotic sequence of sudden and unrelated changes. On the contrary, it reveals consistency and continuity, in which one event grows out of the other with a certain regularity and necessity—though in many cases such necessity is visible only in retrospect. An adequate approach with sufficient analysis could show that there are enough functional regularities among the processes included in becoming to warrant a unified explanation—unified in a sense of consistency rather than of structural unity. This analysis would serve to render

a methodological unity of critical and rational appraisal rather than a closed system.

Such methodological unity, however, is all that is needed in treating becoming events, as, because of their nature, the specific events will always include something new and different from any general scheme that one might construe. It is a guide for the scrutiny of events that is needed rather than a ready-made, closed system, or a technique for the construction of such a system.

On the basis of evidence from biology and psychology, the idea of integration (or organization)[1] seems to describe best the becoming quality of organic events. Integration connotes the merging of two or more events into one, so that a new one, with properties of its own will arise. The factors that served the single events before the merging have their influence in moulding the characteristics of the new event or phenomenon, yet none of them preserve their individuality untouched. And the new properties do not have the quality of a mystic creation, as they can be retrospectively traced back to the factors which effected them.

In the emergence of the new event the factors existing before the process of integration are not the only ones exerting a determining influence. The functional relations into which they enter with each other during the process are also effective. Different properties of the integrating phenomena as well as the conditions created by the situation itself enter into a functional relationship which produces a new phenomenon with properties of its own. And the mode of such integration is not conflict, or the eradication of an opposing tendency by another, or the

[1] Both concepts, organization and integration, are used promiscuously in current literature. Organization usually seems to imply more of an external arrangement, seems to make less reference to the newness of outcome, and to be more mechanistic in character. The concept organization also seems to be used chiefly on a biological level, whereas to describe processes on a human level the word integration appears to be in more frequent use. Yet there are cases where reference is made to the integration of atoms in the molecule, and again to the organization of mental functions. In the present work the term integration will be used, organization being referred to only as quotations used call for it.

pure dominance of one trend by another, but a reorganization of all of them into a new whole.

In order to avoid misunderstanding it should be pointed out that in using the concept of integration the main stress is laid on it as a principle of approach to the analysis of becoming phenomena ; it is viewed as a tool for better thinking, not as a clear cut and definitely substantiated fact, though in biology, as in psychology, this concept is often used to connote such a certain definite fact.

Used methodologically, this principle has the advantage that it does not reduce the great variety of life's phenomena to an aggregate of isolated functions, neutral to each other. It presupposes in the nature of events a tendency of interaction, and thus unifies without eradicating the individuality of specific functions. It permits an outlook that can be continuous and yet discriminating, and which can consequently be applied to the whole range of phenomena of a becoming nature. Rendering a sort of functional integrity to the whole, it is not forced to dispose of qualitative change as something scientific analysis is unable to deal with. It can therefore help in dealing with growth and emergence, both basic characteristics of organic phenomena, without introducing anything alien to those processes themselves. And in doing so it promises to abolish dualism (so unavoidable in a statically atomistic approach) without detriment to critical discrimination.

With the concept of integration as a principle, it is possible to unify many seemingly independent functions, many phenomena that appear unrelated to each other, within one unified, yet diversified scheme. Integration is a functional principle, and as such it offers a more promising basis for the solution of problems like the interaction of mind and body, the interaction of the physical and mental in general ; the difference between reflex action and intelligent behaviour, thought, and action, which, when viewed through the dualistic approach, are perplexing to say the least.

It is true that integration is a blanket term. As found in current use, it might mean almost everything or

anything. But, properly used, it can be of inestimable value as a basis for the analysis of situations and problems in which many deciding factors are emergent and unique. It is an operational term, describing the functions performed, not the specific materials on which those functions are performed, nor the specific outcomes resulting from those functions. Used as a tool, it indicates that certain processes can be essentially the same, even on very different levels and utilizing very different materials, as, for example, integration on a protoplasmic level and a mental level. By helping us to see the structure of general and basic processes, it guides the analysis in any specific instance to the specific factors entering, and to the way in which they enter. Thus the danger ever present in investigation guided by static concepts—the overlooking of the new, of what is not foreseen in the technique of observation, of possible differences in each individual case—is avoided, as the search is not dominated by the aim to seek for final generalities. The quest for uniformity is thus reconciled with sensitiveness for differences and for the new.

If certain factors which go to make up an experiential situation are appraised on their own account apart from that situation, the chances are that their properties and their specific powers to determine the general processes are determined beforehand. Yet if situations are considered as emerging, one cannot assign in advance any specific importance to any of the single factors, because sometimes a small and apparently unimportant factor (small as taken by itself) will make a considerable difference in the situation as a whole. The relative properties and functions of factors entering the situation determine their role in relation to the whole situation and its outcome. The principle of integration stresses the fact that the elements by themselves can express very little about the same elements functioning as parts of a situation. Their particular characteristics will always depend upon the relation in which they stand to the whole, as well as upon the functions they exercise upon each other. In other

words, an element in isolation is a decidedly different thing from an element in relation with something else.

This is especially true of human behaviour. Our images, sensations, feelings, take on special meanings and special colour, and special characteristics when they form part of a certain behaviour unit; and from the analysis of each one of them in isolation (if such a thing were really possible, a possibility that seems to be one of our outstanding scientific fallacies) one would be in a position to say very little about their nature when active as a part of an actual behaviour unit.

Thus the hope to create a unity from disparate elements and partial functions of human or organic life seems to be a vain one as long as the role which integration plays is disregarded. In order to grasp the whole or the nature of its parts, it is necessary to start with the whole. In the analysis of organic phenomena the whole comes first and the results of the analysis possess validity to the degree that the analysis is able to make discriminations among the elements as belonging to the whole.

Still less success can come from a study that approaches the organism, or anything connected with it, on a basis of principles derived from the consideration of its parts only. Thus we know that the organism is composed of certain physical and chemical elements. Also, that it is sustained by processes which are either physical or chemical in their nature. Yet the hope that the organism as a whole may be understood by chemical or physical principles only, has not been realized as yet, in spite of numerous efforts. Nor can such success be expected. These principles are not sufficient for the understanding of the organism in its total functioning. The problems concerning the organism appear to lie on a higher conceptual plane, inaccessible by the constructional conceptions of physics and chemistry.[1]

Prevailing scientific schemes have adhered to a concept of cause and effect relation, in which the constituent parts of a relationship could be evaluated independently of the relationship itself. Only phenomena conforming to this

[1] Spranger, *Lebensformen*, p. 13.

scientific standard of the cause and effect relation, and which would be subject to precise calculations as to effect from cause or *vice versa*, have really been considered proper subject matter for scientific investigation. Events which did not succeed each other with any quantitatively calculable balance were supposed to be subject to chaotic chance, and consequently not a matter for scientific investigation.

However, it is the task of the human sciences to show that there are intelligible, and therefore scientifically traceable cause and effect relations, in events that apparently do not show any quantitative preciseness—events, in fact, which are not the result of equality between causes and effects, but are the product of plus-relations, where the effect end of the relation shows qualities not directly produced by the causes as existing and known beforehand.

Spengler predicts that the twentieth century will produce a great science that "will unite in a great 'physiognomic' order all things human."[1] The term "physiognomic" he applies to disciplines like history, that have organized themselves around more flexible guiding concepts than the idea of the strict cause and effect relation and of the atomistic inventory system of isolated events. Such a physiognomic order would trace events that are related to each other by sequences of cause and effect relations, in which the effect would include more than the direct consequences of cause. It would trace also the effects of the relation itself and of the circumstances as well as a whole cumulative sequence of causes and effects in the past.

Such an order would give living organisms a chance to enter as deciding factors because they are *living organisms*. Because there are manifestations in living organisms which, when considered apart from the organisms, belong to the field of exact sciences this order would not subject them to the regularities found or invented for the fields of the exact sciences.

[1] Spengler, *Decline of the West*, p. 100.

There are enough indications to substantiate the statement that the scientific scheme as we have known it, failed to include a wider range of phenomena within its scope because it failed or refused to give consideration to that type of law and order as is expressed by the organism as a whole. Thus Whitehead points out that

"it is the defect of the eighteenth century scientific scheme that it provides none of the elements which compose the immediate psychological experiences of mankind. Nor does it provide any elementary trace of the organic unity of a whole, from which the organic unities of electrons, protons, molecules and living bodies can emerge. According to that scheme there is no reason in the nature of things why portions of material should have any physical relation to each other. Let us grant that we cannot hope to be able to discern the laws of nature to be necessary. But we can hope to see that it is necessary that there should be an order of nature. The concept of the order of nature is bound up with the concept of nature as the locus of organisms in process of development."[1]

Whether the organic order is the true order of all natural events nobody as yet can affirm. But it is true that there are events which are organic in their nature, and which therefore require methods of investigation and categories of systematization of their own.

There is still another group of problems where the application of the principle of integration might be of great assistance to an adequate understanding of organic phenomena. These are the problems concerning development and evolution. The theory of evolution found that as development goes on, new species, or new qualities new to the species as known before, emerge. The organic world evolves new and different forms of life. Some explanation was to be found for this phenomenon, a phenomenon that the classical mechanistically atomistic theories of equality of causes and effects could not grasp satisfactorily. Those theories were able to deal adequately with any short range of such evolution, but gaps were

[1] *Science and the Modern World*, pp. 107-8.

always left in the total sweep of development. These gaps the traditional schemes of cause and effect relation cannot bridge. While scientific thought was advanced enough to reject the attribution of the cause of these seemingly sudden emergents to some mystic or supernatural force, or to satisfy itself with some blanket term, a new principle for viewing organic events and forces determining their functions remained to be found, if a plausible explanation was to be forthcoming.

The notion of organization was used in biology to explain growth, and later also to explain the appearance of organic life in its different stages. After the first sweep of Darwinism had passed, biologists found themselves asking what precisely made the species develop, what precisely produced new forms of life from the old forms. And, as scientific training has turned the minds of investigators toward finding some exact cause *behind* every phenomenon (rather than *within* it) the concept of evolution acquired the meaning of some sort of force producing the development of organisms. The term " organization " was also used, but used as applying to a sort of re-arrangement or shuffling around of elements that were final as to their number and qualities. As a result, the universe was regarded as predetermined, and the evolutionary course as computable and predictable.

Later developments of the theory of evolution show a change in these conceptions. Jennings has described the old and the new conceptions of the evolutionary process as follows:

" Evolution is often identified with perfect mechanism . . . the universe as a whole, or any limited sample of it, is a set of particles of one or a few kinds, moving according to certain few invariable laws, the consequent successive groupings of the particles constituting the universe at diverse periods. The process of transformation of the groupings is evolution. . . Evolution is the working of a great machine that never alters its mode of action nor the nature of its product. . . Science is the examination of what this machine does and produces. Its ideal method is computation.

. . . Nothing essentially new or unexpected can come out of this machine."[1]

Today the theory of evolution holds

"that the conception of the universe as *nothing but* a set of one or a few kinds of particles moving according to a few immutable laws exemplified at any time and anywhere that particles occur, is pitiful in its inadequacy. . . It holds that new things, not thus computable, appear as evolution progresses. It holds that with these emerge new methods of action, following new laws; methods not before exemplified; methods that falsify the results of computations based on former methods of action. . . It holds too that the properties of living things depend on those of their physical constituents *when the latter are in living things*. . . "[2]

This is upholding the viewpoint that it is not elements taken by themselves but elements in a certain context that determine what things are and how they will act. A molecule functioning in a living body is different from the same molecule in inanimate matter. It has different properties because its manifestations are different.

This means that an aggregate of causes found in the factors of evolution prior to the actualization of that process is insufficient to explain evolution, and that we have to try to find causes in the nature of the process itself. This is impossible unless to the process itself is attributed the capacity of interaction and productivity, which means that the single processes and their factors are to be understood as capable of integrating with each other. The dynamics of development can have a convincing explanation only when the basic and elementary processes in it are credited with creative dynamics and interaction, productive of effects, of which all those processes would be incapable when taken as a sum and not as an organic unity.

Integration has been very readily accepted as an explanatory principle applicable to certain partial processes or for certain groups of processes, as for instance,

[1] Jennings, H. S., *Emergent Evolution*, pp. 1-2.
[2] Idem, p. 2.

in the formation of all kinds of animal societies, or in the protoplasmic organization producing new forms of organisms. But it has taken a long time to reach a stage where this principle can be advanced as an explanation of the whole pageant of life, beginning at so remote a level as the transformation of inanimate matter into the animate. Yet there still seems to exist a serious gap when we arrive at human phenomena. Particularly in the psychological explanations of human behaviour, the mechanistic principles still appear dominant. And here, if any type of organization is used, it is a transposition to human phenomena by analogy of the kind of organization observed on the organic level or in biology. The continuity of the whole process is broken ; the evolution of the process of organization itself appears to have stopped when the human level was reached. But a further analysis of the process we call integration is needed for a fuller discussion of this problem.

III

Several aspects of the process called integration call for special stressing, although they have already been touched upon. In the first place, integration is a process and occurs as a result of processes having some kind of effect on each other. The substantive or existential factors of the integrating processes also enter as determinants, but only to the extent that they are able to enter functionally, i.e. as factors actively taking part in a working whole. Thus, to say that such and such an organism or behaviour unit is an integration of some other elements, means that those other elements are interacting with each other so as to produce a new unit. Elements previously independent can be brought together in one integral whole, because they are not so neutral to each other as not to possess the capability to interact, and as a result of such interaction, to develop new properties not possessed when active in isolation.

Köhler in this connection uses the term "relative properties," to denote something similar to what here we have called the emergent or acquired properties. Though this term "relative" is apt to be misconstrued as implying other properties which are not relative, still it possesses the advantage of stressing the fact that at least these properties are only the result of some relation, and that therefore their permanency is that of the relation itself. It calls attention to an experiential situation which is not solely the product of the permanent properties of the component elements as revealed by the structural analysis. It stresses the individual organization of the inter-relation of these elements and of their properties in a particular situation, and the emergence of what may be called new factors in the same situation.

Everything that experimentally is found to make a difference in behaviour should be counted as a factor in the situation, regardless of its existential status. Thus, in analysing an experiential situation, not only its component sense materials and the processes resulting therefrom should be taken into account, but the time element, the particular sequence of events and processes, and the particular pattern in which they interact with each other should also be counted as determining factors of the situation. Conscious behaviour, for example, is not only the result of a refinement of the connections in reflex arcs, of nerve currents and their combinations, although a static analysis might reveal no other elements. The factors producing conscious behaviour are reflex arcs to be sure, but reflex arcs organized in relation to each other, in relation to their sequences and directions, which organization is capable of producing additional factors of behaviour besides the original reflexes.

In considering interaction as the basic characteristic of the integrative process, no new hypothetical process is introduced into the course of events. Interaction is a characteristic of all events, and Bridgman, from the standpoint of a physicist, states that no knowledge of any physical property or even mere existence is possible unless

the things and properties studied are in interaction and thus have observable effects.[1] Interaction is more real than action and reaction taken separately. "There is no action without reaction" says Dewey; "there is no exclusively one-way exercise of conditioning power. Whatever influences the change of other things is itself changed."[2] We cannot know anything about an electron or a nerve current or an idea unless there is some interaction with the rest of the world. Only by interacting with something else are observable effects produced and awareness made possible; and that interaction has, in its turn, an effect on the role that electron or nerve current plays.

A second important aspect of the process called integration is the continuity of a certain pattern into which single events are woven. The first implication of this is that whatever happens is the result of previously existing relations and patterns. The process is continuous in the sense that the qualitatively different *now* can be traced back by inevitable sequences to what was before. Becoming is not the result of mysterious creative acts or forces; it is a slow, continuous process in which it is possible to discover the determining factors, although all the specific outcomes are unpredictable, because some of the determining factors are themselves emerging and therefore unforeseeable. There are no sudden unexplainable gaps. The pattern itself has a definite, directed woof, a clear structure, and therefore serves as a basis for reasonable prediction—granted, of course, that it is seen and interpreted rightly. Predictions concerning the developing personality are made on the basis of such patterns. The same course, in fact, is followed in economic and social predictions that are beyond statistical computations. The generic phases of a developing process belong together, forming an organic whole in which the single phases take a definite place in the cumulative and directed sequence.

[1] *Harpers*, March, 1929, p. 448.
[2] Dewey, *Nature and Experience*, p. 73.

A pattern differs from a mechanistic unit by such flexible and yet definite woof. This woof is not effected by circumstances external to the forces productive of the pattern itself, but is due to an interactive interdependence of the processes within it. Mechanistic unity either has no design, or has a design definitely fixed by topographical or some other external conditions—a design that is statically limited and set. When one talks about the patterns of one's behaviour, or about patterns of life or patterns of culture, one does not refer to such externally fixed framework, but what one has in mind is a dynamic, flexible and yet definitely directed and unified pattern. The patterns of life are not mapped out directions, fixed and ready to be followed without fail. They are dynamic potentialities, the actualization of which is dependent upon and conditioned by concrete situations in which the specific elements are joined or severed according to some unique principle, or shade of feeling, or way of reacting. The belonging-together in a pattern is thus more intimate, yet more flexible, than any that could be effected by an external force, time, or space element. In other words, in a mechanistic unit the elements are neutral to each other and have to be held together by an external framework. An organic pattern, on the other hand, has received its unity from the internal affinity of the elements and processes producing it.

One of the most important, and also one of the most disputed, aspects of the process called integration is its creative aspect. Interactive processes are capable of producing new processes and therefore are capable of producing new properties and structures from the elements on which, or through which, these processes are actualized. When this interactive quality of the processes is overlooked, the statement that integration is creative sounds as if the mythical acts of creation were being revived in scientific language under a new disguise. The figurative way in which some writers deal with the dynamics of becoming is conducive to such an impression. Thus we find Eddington stating that " not once in the

dim past but continuously by conscious mind the miracle of creation is wrought."[1] Expressions such as these are suggestive of a return to mysticism through a dynamically interpreted scientific outlook.

The creativity of organic processes is often referred to in modern biology. The ordinary phenomena of growth, as well as that of evolution, have been defined as creative processes.[2] Yet in no case is the creativity understood as a phenomenon which would involve or imply the interruption of natural processes that the traditional concept of creativity calls for. In physics it is known that a new reorganization of energy releases energy. In the organic world such reorganization not only releases energy but also creates new potentialities for behaviour.[3] Certain functions, when released, enter into new relations with the environment, and produce a new type of behaviour, which in its turn is productive of new elements in man's environment in the form of things, processes, ideas and institutions.

These new products in their turn enter the integrative process as new factors, and, being new factors will introduce changes ; and so the process of creation proceeds, not as a miracle but as a continuous and natural process. The difference is essentially in the release of energy activating capacities that were not functioning previously.

All the major steps in the evolution of man and his man-made world can be traced back to such liberations of energy and potentialities, and to the reorganization of capabilities as described in the discussion of the integrative process. Creativity is exhibited in all such processes. There is no fundamental difference between the creative acts exhibited in the growing of a tree, the construction of a boat, or the production of a poem. They are all instances of the liberation of energy and capacities by the integrative processes, and of the new integrations resulting therefrom. The difference in the

[1] *The Nature of the Physical World*, p. 241.
[2] Herrick, *Fatalism and Freedom*, pp. 20-1.
[3] Smith, M., *Education and the Integration of Behaviour* ; Child, J. in Dummer, E. S., *The Unconscious*.

final product, judged in reference to its creativity, is due to the difference of the participating functions and to the difference in the nature of the integrated elements. Considered from the standpoint of the general structure of the basic processes, the making of a boat or the growth of a tree are no less creative than the making of a poem. The reason why creativity is more apparent in the latter process is because the processes and factors producing the first are more overt, therefore more comprehensible, than the factors entering into the making of a poem.

In each of these cases something new was produced, capable of functions different from those of the participating elements and exhibiting qualities different from those of the sum of the factors involved. In each, the process is that of liberation through integration and reorganization. It is a process where single functions have integrated to form a larger, more unified, complex unit of activity. It is a process which does not make a definite break with the past. It grows out of the past with determined continuity, which means that some sort of principle of causality—if we choose to call it so—is working in it. The present is determined, but not wholly predetermined, by the past. The process of determination is a continuous forming of the same, each present event or factor having its share together with the past.

Modern biology has demonstrated the existence of this creative type of causality. Herrick describes it in the following way:

"Ordinary growth is an act of creation. . . This is the natural functional expression of protoplasmic organization and the growth implies that the organization changes from moment to moment as the process goes on. Learning is a creative process of the same sort. . . Evolution is the pre-eminent natural creative process. . . When he (the biologist) says that the present activity has been determined by preceding events, he means that the present structural organization of the body reacts to stimulating agents in ways which his experiences show are orderly."[1]

[1] *Fatalism and Freedom*, pp. 20, 23.

Thus causality might be defined as "a determining agent in the sense that the succeeding history would be different if it were not there, and in this sense it is a necessary component of this particular sequence."[1]

The determining agents of processes such as growth, integration, emergence can themselves be of a very different nature from the resultants they produce, without in the least imposing that nature on the resultant. Growth would be inconceivable if it could produce only what is already actually included in the factors producing it. And evolution would be inconceivable if the factors and processes on one existential level could not interact with factors and processes on another existential level. The static outlook has found it difficult to explain the apparent correlation of the inorganic, organic, and mental processes, because it is hard to see how existentially static physical matter could enter into any interaction with the existential mental matter. But it is quite conceivable that functions on a mental level could be influenced by organic or inorganic processes if they were parts of the same total process. Thus emergence, as a novelty of behaviour, is produced by the integration of elements taken from mental, organic, and inorganic levels, and the results of that interaction "constitute a whole distinguished from their mere sum or resultant."[2]

This does not mean that the interaction as such is some magic creative formula. Any element of reality has unlimited potentialities awaiting to be brought out by new types of activity. A new organization of activity through the interaction of elements which previously have been separated produces possibilities for new types of behaviour.

Therefore, when the result of an emergence shows qualities differing from those heretofore ascribed to the elements producing it, it is not a case of something impossible or unnatural. A careful scrutiny will show how an integration of previously separated processes has transformed new potentialities into actuality.

[1] Wheeler, *Emergent Evolution*, p. 6.

[2] Idem, p. 14.

Through integration a new unity is produced that has absorbed the individuality of the previously independent elements. Two ideas and two ideas do not make four ideas, but a new idea. It may be more complex, more involved, more clarifying, but still it is one idea.

A group of twelve persons is not merely twelve persons, but a new quality.[1] And a joint social activity is different from all the component individual activities. It is a new whole, and the individual activities are scarcely recognizable in it.

"When I put my opinion together with another man's," says Delisle Burns, "and we agree on a common opinion, I can be aware that the opinion is different from what it is when I form my own opinion. But when we agree I cannot distinguish one element in the opinion which is mine and another which is his."[2]

All this does not deny the possibility of analysing and understanding how this new qualitative unity was produced, or what functions and what elements entered into the process of its making, and how it was determined.

To say that the emergent is qualitatively different means that to some degree it has individuality of its own. The emergent, in a way, is a law unto itself, and cannot be entirely pressed into a general formula. This new, whether it means the difference between an organism and a human being, or it indicates the difference between two individuals, to some degree acts on principles of its own, and consequently has to be understood not through analogy or general formula, but from careful investigation of its own nature and behaviour. What man has in common with other organisms, or in what he differs from them, is to be decided through exact and unprejudiced investigations and not by analogies drawn from a study of lower organisms or physical phenomena. And no general study of human behaviour can be a complete substitute for the study of each individual as such. The former always has to be supplemented by the latter.

[1] Lindeman, *Social Discovery*, p. 127.
[2] *Contact Between Minds*, p. 15.

IV

Is integration an order of events on the organic level only, or do we find something in nature in general that suggests the existence of an order similar to that described in the principles of becoming?

Opinions on this point have traditionally grouped themselves around two main schools of thought: one holds to the viewpoint that all order is the product of conscious and reflective mind (Idealists); the other maintains that nature is possessed of order, and that our minds are discovering it and copying it (Realists).

As to the first viewpoint, there is undoubtedly a specific type of order that is the result of the interaction of humans with their environment. Our perception introduces groupings, our reflection introduces classifications, which could hardly be conceived as pre-existing in the nature of events independently of these interactions.

On the other hand, there is some reasonable ground to suppose that there is an order in events, independent of the intellectual classification of these events or even the conscious grouping of them; also, that there is an order in physical nature that is not entirely dissimilar to that which we observe in our experiencing, for experience is a resultant of interaction between the "experiencing" and nature, and such interaction would be out of the question if the two worlds were totally different.

After the faith in the idealistic picture of the world, and its order as a construction of the human mind, had waned, and the parallelistic theories became equally unacceptable, searching thought turned towards finding something that would explain satisfactorily the experiential interaction of the world without and the world within. Empirical theories as to the ultimacy of experience helped greatly toward viewing the world of reality as something not so utterly different from the world of experience. And of late we have seen several rather notable statements concerning the dynamics of some underlying, similar "ultimate processes" to be found in both the inanimate and the organic world.

Thus Noble[1] has developed an interesting theory concerning the affinity of physical phenomena with phenomena of the organic world and the world of mind. He maintains that forces in physical nature organize themselves into systems where the unit is subordinated to the whole and where energy is also so organized that its direction in the unit is subordinated to the direction and organization of the whole. Any minute part of such a system, says Noble, can be understood and interpreted as mechanical, but the system itself shows " organization " and " intelligence." And in this respect he does not see any essential difference in the organization of either physical, chemical, or social systems. All of them show an organization of forces where the unit is subordinated to the system, with the exception that the forces themselves are of somewhat different nature.

" If these units are dynamically interdependent [he says], individual yet collectivized, separate yet reciprocally involved, stressing yet stressed, holding yet held—the accumulated power of all must reflow from whole to part, not only as power of maintenance but also as a power of determining change. Here is the primordial subordination of part to whole, the primordial domination of unit by system, with their derivative forms in all material aggregates whether inanimate or alive. Nowhere do we find the inorganic one indifferent to numbers, but rather yielding and receiving—lifted as it were, at least partially, out of itself by its association with the many."[2]

Forces thus organized for the maintenance of the system are capable of a group action as the result of the organization of all the powers included in the system. Resistance as a force in inanimate nature is a result of such group action ; it is effected only as a joint organization of all the particles involved, and accomplishes something that every one of them (taken individually or even together as an unorganized aggregate) is incapable of.

Noble agrees that on the physical level this interplay is but an interplay of forces, yet in so far as such interplay

[1] *Purposive Evolution*, p. 188ff.
[2] Op. cit., pp. 332-3.

is capable of producing something dissimilar to the nature of those forces themselves, the emergence of organic out of the interplay of physical forces appears more probable. Furthermore, the interplay of the physical and of the human, where the latter does include processes similar in their nature to the former, is more accessible to explanation.

It is true that systems and their ways of maintenance on a physical level are different from organic systems and their ways of maintenance, but this fact is by no means a contradiction of the principle of integration. Such diversifications go to make up integration—in fact, they make integration possible. The types of integrative systems depend on the "relative properties" of the elements entering the system and on the types of active relationships. We cannot deny that these factors are different on the organic level from what they are on the physical level, and those on the human level different again from those on the organic. The essential similarity is in the relationships and functions of the elements as viewed by this principle.

It has been frequently pointed out that order in physical nature is not solely a creation of the mind, and that there is reason to think that the order experienced by humans is itself somehow caused by an order outside of us.

> "We are by no means forced to face the miscellaneous world *en masse*," observes Dewey. "Things are pointed to in kinds and possessed of order and arrangement. The adjectives denote that things present themselves in characteristic contents, with different savours and colours, weights, tempos and directions."[1]

The question of the organization of events, both as independently of experience and from the psychological point of view, has been discussed rather thoroughly by Gestalt psychology. The general position of this school is that organization and not atomistic mechanism is a typical mode of happening in all events. The complex is

[1] *Nature and Experience*, p. 15.

not a sum of elementary contents and parts, but a unit by itself.

"Only very seldom and only under very characteristic circumstances, in very narrow limits and maybe not at all, is the actual *Undsummenhaftigkeit* (summative aggregate) present; and it seems not to be adequate to take this extreme case as a typical basis of all happening. . . Everything (*das Gegebene*) is shaped in different degrees; only more or less structured, only more or less defined wholes and total processes with different concrete total qualities, with inner orderliness, characteristic total tendencies, and with the determinations of the total whole for the part, are experienced."[1]

Köhler, talking of all physical events in general, finds that physical events are orderly and do not need any arrangements *ad hoc* presupposed by the Aristotelean picture of the world. "Dynamic interaction, undisturbed by accidental impacts from without, leads to orderly distribution though there are no special regulative arrangements."[2] He finds this to be true throughout all the physical universe, from the solar system to the interaction of atoms. Thus when two atoms come into the sphere of their mutual interaction, the play of dynamic interaction immediately begins, and, as the case may be, depending upon their "relative properties," they "either separate again or they form an orderly molecule, an architectonic structure."

There is a certain danger in drawing a line of distinction between events in general and events as they are perceived or as they enter our experience. Such distinction usually introduces the classical epistemological question of reality as existing *per se*, as *Ding an sich*, as opposed to phenomena or things experienced. It presupposes two totally different realms, a procedure which is methodologically unsuitable for our purpose. It would be much more appropriate to start with events as events, to discuss first aspects which they have in common, and then to make distinctions on the basis of that common background.

... er, *Psychologische Forschungen*, Vol. I, p. 52, 1922

[2] *Gestalt Psychology*, p. 139.

But as the dualistic conceptions in thinking about events in general and those of experience are too deep-rooted and too general, it is necessary to use an opposite process: namely, to start with distinction and then proceed to point out similarities, in order to show that events on the human and the organic level are not utterly discontinuous with the events on physical level.

Most psychologies of today deal with human behaviour as if it were an aggregate of discrete processes and not an organic unit with the properties and the methodological demands described in the preceding chapter. Discrete elementary behaviour acts or parts of such, one-to-one relations of stimulus and response bonds, reflex arcs that run their own way irrespective of the direction of the total activity of the organism, constitute the main objects of interest. Dissection of unified and complex behaviour acts is the predominant methodological procedure, and also is the chief aim of most psychologies to-day.

This methodological approach presupposes a neutrality and independence of the elementary functions of which human behaviour as a whole is built, not only as regards to each other, but also as regards the human organism and its activity as a whole. The stimulus-response bonds or paths, as well as the so-called original tendencies and reflex arcs, are presented as units in themselves, directed by external stimuli, not by the organism. The combinations and connections of the single functions are considered as brought about by external stimulation, which affects the organism at random, without any directed choice. Conditioning and associations are the *deus ex machina*, bringing unity into the barren, box-like organism which the human being is supposed to be. The connections and combinations effected by such means are as fixed and inflexible as those between the original stimuli and their responses. Causality is a perfect one-to-one relation of cause and effect, so that one can exactly

compute the one from the other. To quote the proponent of extreme behaviourism, Watson[1]:

"Stating our goal in slightly more technical language, we can say that the behaviourist's job is—*given the stimulus to predict the response—given the response to predict the stimulus.* A blow to the patellar tendon (stimulus) evokes the knee jerk (response). Stimulating the tongue with vinegar (stimulus) makes the salivary glands to pour out their secretions (response). These are life reactions reduced to their simplest terms. But according to the behaviourists, life's most complicated acts are but combinations of these simple stimulus-response patterns of behaviour. Even thinking—memory—personality are but easily understandable integrations[2] of stimulus-response behaviour."[3]

What is striking in views like these is not only the utterly discouraging atomism, but also the rigid fixity of everything concerning human behaviour, so contradictory to the impression one gets from experience. This fixity in the conceptions concerning the elementary and basic functions has also affected other psychological concepts. Fixity is found to be the characteristic of habits, of emotional backgrounds and complexes, of ways and methods of learning. Fixity describes the whole psychological outlook of the behaviourists in the wider and narrower sense.

Selective choice and self-determination in human personality seem to be concepts that do not exist in the vocabulary of behaviourists, and to a great degree in the vocabulary of most of our contemporary psychologies. Personality is supposed to be devoid of any such determining capacity. It is left to the mercy of chance conditions in external stimulation. It is not the product of

[1] Watson is an extremist in many respects and other behaviourists may not share his views entirely. But in regard to the mechanics and the inflexibility of the behaviour patterns, his point of view seems to be shared by all the so-called S-R psychologists, though this is not always directly admitted.

[2] One must not be misled by the term "integration" as used by Watson. It does not mean anything more tl [illegible] tion by conditioning.

[3] *The Ways of Behaviourism*, pp. 2-3.

stimulation by meaningful things in our environment, but is a result of an elementary atomistic stimulation of our senses. Statements like the following are very frequent in present-day writings in educational psychology:

"All forms of human behaviour, whether muscular activities such as those of grasping, striking, or speaking; glandular activities, such as the secretion of tears, saliva or gastric juice; or mental activities, such as perceiving, imagining, remembering, thinking or reasoning, are reactions to definite stimulation."[1]

The statement that all our forms of behaviour are reactions is a very true one and cannot be emphasized enough. The trouble is that the reaction to a "definite" stimulus has come to mean a definite reaction to a stimulus that is but an abstracted element of the total stimulating situation.

Are the reactions to isolated, elementary, and meaningless sense stimuli the characteristic aspect of human behaviour? Can behaviour be understood only in terms of these? And if so, what are the consequences?

There is no doubt that reactions of this type—the type Watson and Gates have selected for their examples—occur in human behaviour, but as studied by them they occur only under conditions of controlled experimentation; that is, in artificial situations. They do not occur in normal experience. And even in those experimental situations, one may question the possibility of the existence of purely single and isolated reactions to single stimuli. These stimuli are part of a larger stimulating situation, and what psychologists are able to observe for themselves is largely an abstraction made for the sake of proving a theory, formulated beforehand. If such reactions occur under normal conditions, they are so rare that an attempt to use the principles culled by observation of such cases for the explanation of all human behaviour is highly unjustified. Experimentation with abstracted stimulus-response patterns is desirable for certain limited

[1] Gates, *Psychology for Students of Education*, p. 24.

purposes, but a clear distinction should be made between what happens in experimentally controlled situations and what takes place in reality. Psychologists should not substitute abstractions for real human behaviour, or from the former deduce principles for the latter.

Organic behaviour is of a totally different character from the one constructed by such psychologies. Humans as well as lower organisms react to objects and to meaningful situations in their environment, and do so in the course of, and by the direction of, some activity initiated by themselves. Biological investigations have definitely proved that even organisms as simple as those able to make only two different types of responses are capable of behaviour differentiated to some degree, which cannot be fully understood by such mechanistic conceptions. The behaviour of such organisms does not occur in terms of an isolated and immediate stimulus but is a function of objects and complex situations in environment, including elements like position, direction, degree of concentration, of stimulating matter, rates of change, and so forth.[1] This, of course, does not mean that these elements are grasped by lower organisms as such. It only means that when different stimuli are demanding more than one reaction, these several simultaneous reactions organize themselves so that the total reaction is different from and more than their sum when appearing separately. Such organized reactions make possible a behaviour specifically directed towards some phase of the environment, and thus add to the apparent purposiveness and intelligence of the organism's behaviour.

Such apparent directedness and purposefulness of behaviour is not an aspect added to the original and normal behaviour of the animal after several repetitions of identical situations and reactions to it, as the traditional psychology would have us believe. The two reactions did not get connected because of temporal or spatial co-existence and the conditioning or association caused thereby. Such organized behaviour is as primary as the single

[1] Holt, E., *Freudian Wish*, pp. 76-7.

reaction. They are both direct functions of an environmental situation and of the animal's sensitivity to it. Reflexes do not function independently of each other, as the stimuli to which an organism is sensitive do not stimulate independently of each other, unless they are temporally or spatially segregated. Consequently, the fact that other reactions are activated at the same time, makes a great difference in the direction of one of them. The reactions integrate themselves, so that none of the single ones keeps to the course it originally had in isolation. A new course is the result, a course on a higher level of complexity as compared with the part-responses. It has a quality of its own, and acts according to principles of its own.

Another interesting fact in connection with such integration of unconscious behaviour is that the direct immediate stimulus does not have the importance in directing behaviour that the proponents of the S-R theory would have us believe. The immediate stimulus recedes in importance to the degree that integration proceeds, that is, to the degree that the organization of the responses themselves enters as a directive factor in behaviour. The description of what an organism does in that case includes not only the description of the stimulus and of the response made to it, but of the organization of the reactions themselves.

But there is also psychological evidence in support of the argument against the atomistic conception of the reaction mechanism. Experiments performed by Gestalt psychologists have shown that there are processes in which the external stimulus is but a starting point, and the process of reaction is carried on by the dynamics of nervous currents unaided by the stimulus, and in a direction not given by the stimulus. Thus, a figure suddenly projected on a dark background does not give the impression of shape and size which it would if projected on a light background. It appears with an energetic movement of extension as well as of approach.[1]

[1] Köhler, *Gestalt Psychology*, p. 128.

This movement and extension are not provided by the stimulus ; it is either an effect of a particular organization of several factors under which the stimulus is provided (the tempo of projection, the nature of the light at the particular moment of projection) or due to the organization of nervous currents under the particular type of presentation of the stimuli, and the condition of the perceiving organism in general. It is a known fact that two stimulations of the skin at a certain distance from each other and in the proper succession give a sensation of movement. In this case the response of the individual is only partly caused by the direct stimulus. The conditions under which response is made, determine the ultimate result just as well as the direct stimulus itself. This whole unit of a behaviour act is organized, and can be understood without any reference to association. Such reaction occurs as a primary, not as a secondary one, or a product of association formed in previous experience.

It would be misleading to apply the atomistic formula of stimulus-response to such cases, because the formula neglects to take account of the fact that between the act of being stimulated and that of making response a process of interaction and organization takes place, and that the ultimate reaction eventually depends precisely on that process of organization. All the factors of the stimulating situation—the lighting, the tempo of projection, the size of an object, the attitude of the subject—they all form a unified situation, the parts of which, though they do not have a definite counterpart in the response, contribute towards a difference in the final organization of the response.

Even in the case of the unconscious reflexes, the response is not a crystallized product fixed by past experience, and unaffected by the situation of the moment. In the reflex act some adaptations are made to the demands of a situation. The act is modified by the specific conditions, and in turn changes the situation by suffering modification. Such mutual and reciprocal change taking place in, and effected by, both the stimulus and response

(which has been quite aptly termed by Holt a circular response) is characteristic of all organic behaviour, unconscious responses included. There is a mere possibility of each least component of the organic behaviour being adequately explained in terms of one-to-one relation, of immediate stimulus and response, but a co-ordinated totality needs supplementation by consideration of the factor of integration of those least components.[1]

On the conscious level the integrative character of behaviour is, of course, still more apparent, even in the case of behaviour where meanings, in the sense of intelligent thinking, do not enter. Sense perception of the simplest type exhibits the characteristics of organization of stimuli, and the isolated sensation theory here definitely appears as a psychological fiction, the product of the laboratory attitude, serving other ends than to give an adequate description of the processes of sensory experience. Ehrenfels has pointed out the organized character of sense perception. In studying the sensory processes involved in the perception of music, he found it impossible to state it in terms of single sensations of tones. There was found to be something more to a melody than a mere summative sensation of all the tones included. This sensation which he calls a "Gestalt-qualität," was found to be caused more by tones in a certain arrangement than by any one tone in particular. There are many other qualities which, like melody, cannot be understood and do not exist for us in any single stimulus-response relation, but which require a constellation of stimuli to appear at all. Thus qualities like the comic, tragic, harmony, symmetry—even those of shape and form—cannot be conceived as the results of single stimuli. Qualities such as these are the result of the organization of both stimuli and responses, and many of them have no definite partner on the physical side.

Even a comparatively simple sensation like the sensation of the colour blue is a combination of several more elementary sensations. Sensation of a certain degree of

[1] Holt, E., *Freudian Wish*, pp. 156-7.

brightness certainly is a component element of any colour sensation in any situation. If to this complexity of the sensation is added the fact that perception usually occurs in some course of action with some kind of attitude on the part of the subject, it is quite apparent that the task of reconstructing experience with any degree of adequacy from the unorganized, single stimuli only, is quite hopeless. Blue as an element in a summer landscape of the beach vacationist and the same shade of blue worn by a disagreeable-looking person evoke entirely different responses and not only because of the associations involved, but also because the wholes to which those elements belong themselves give rise to a different perceptual background. Often some aspects of a situation, which are transitory and do not seem to have any direct connection with the sensory elements, influence the total response more strongly than the direct sensory components of the situation, and an observation or experiment constructed so as not to include these will view the whole of a situation in a very inadequate light. And we can be sure that the whole field of consciousness is pervaded by integrations like blue and brightness, melody and organization of tones in tempos and keys, or as blue as an element of the sea or as part of a costume.

Thus sensory experience, besides being a result of organization of the stimulus, definitely includes also integration of the wider elements in the situation, such for instance as the attitude of the perceiver himself, because from the functional standpoint the attitude forms an important element of the stimulating situation.

Each of the constituent elements contributes to the total result, the final sensation. The attitude of the perceiver has a decided effect on the resulting sensation. " When we analyse a clang we hear several notes appear successively in the mass which previously we heard as a unity."[1] In either case the stimulus—conceiving it as separate and independent from its perception—is the same. The physical vibrations have undergone no

[1] Köhler, *Gestalt Psychology*, p. 124.

change, yet the sensations in the two cases differ. The only factor that has changed is the attitude of the listener. We hear a clang when the attitude is non-analytic; we hear tones when the attitude is analytic. Under the same constant stimulus-conditions our attitude can transform one sensory reality (clang) into another (succession of tones). Strictly speaking, it is not only the attitude as experience which changes, but also its underlying physiological process. And such a change is not produced arbitrarily; it follows of necessity definite antecedents.

Attitude is often described as an " arbitrary " element, something external to the " real " situation. This is so only for a static and atomistic point of view, which sees the stimulating causes of perception only in existentials. From a functional viewpoint the attitude is a new element introduced in the stimulus-response situation; therefore the situation is a different one from the previous one where the attitude did not participate. How the attitude is functioning in order to produce that effect, and what new nervous functions are involved in the process—these are questions the answers to which are to be found by specific experiments.

There is still another kind of organizing factor to be taken into account when perception is viewed not as a single instance but as a part of a continuous process, and that is that the stimulus is not set and statically definite. Its exact content changes while the process of perception is going on. That change is the result of new elements entering, as well as the effect of responses already made. The beginning of the behaviour act might occasionally be a function of environmental stimulus. Larger continuities of behaviour show that they are determined by both the organism and the environment, and are therefore a function of both.

A ball in the act of being played is not one static definite stimulus, but it is successively: (1) a ball-approaching-me-at-a-certain-angle-and-certain-speed; then, (2) a ball-to-be-thrown-to-somebody-else; etc. Each successive

situation is therefore calling for a special response. This response, when fulfilled, is deciding what the ball as a stimulus will mean in the next instant: whether it will be a ball-thrown-to-this-person or a ball-thrown-to-that-person. The difference between such a situation and the reflex situation is supposed to be that in the latter the responses follow each other in a definite, pre-established succession without any reference to what has come before or what is coming afterwards—to the specific meaning of the total situation. That means that in reflex acts responses are mechanically set. In the non-reflex acts responses are definitely progressively organized in terms of an evolving situation; they are made in terms of what happened and what is anticipated. The reflex arcs in such acts are in potential readiness. All movements entering the process of organization are touched off to a certain degree, are in a state of preparedness involving several alternative courses of action. Looking at something touches off responses involving grasping, avoiding, approaching and many others. The actualization of any one of them will depend on the net result of the first act of looking. The actual responses are made neither in terms of those readinesses exclusively, nor in terms of some general static stimulus. They are made in terms of an evolving situation, which is a continuous succession of constellations and organizations of stimuli and of specific responses to these.

Consequently the accurate description of perception cannot ignore the organization of responses as regards the future behaviour acts, the specific meaning of the situation, and the attitude and the purpose of the person or persons included in that activity.

"It seems clear," says Bode, "that conscious behaviour involves a certain *process* of organization which constitutes a differential. The units entering into this process are definitely organized systems of neutral discharge. . . Given a certain amount of plasticity, the nervous system builds up specific forms of response for certain objects or situations, and these forms of response subsequently become the material

from which new organizations or new modes of response are constructed."[1]

One interesting aspect of the integration of behaviour is that the more complete the integration of the functions of the organism, the more comprehensive is the activity it is capable of performing. Elementary functions that originally required all the energy and attention of the organism do not demand, when united in a more comprehensive whole, either the same amount of energy or the same amount of attention. Walking, early in our life, is a tremendously absorbing activity; yet later on it can be made a part of any more complex activity without specific attention being devoted to it. Reading is likewise a hard task if every word is read as a specific element; yet when attention is concentrated on a passage as a whole, it is somehow easier to grasp the meaning of all the words included in it. Some of the activities thus integrated become automatic in the sense that they only need starting off for the rest of the process to be carried on by itself. But there are also activities that can never be thus automatized, which are always requiring fresh adaptations to the demands of the situation, and which nevertheless can be performed with very little specific energy when they are parts of a larger unit of activity.

It should be observed that most of the so-called automatic actions always require a certain amount of integration with the situation. Walking, usually given as an example of automatic action, is never a mere "taking one step after another." We always walk in a certain direction; we walk along the street, where we have to pass people, avoid cars, and make numerous other adaptations to a changing situation. Yet we can devote our attention to things entirely different from the business of walking, not only because the elements of walking have become automatic, but because those elements, including the non-automatic ones, have been integrated into one continuous stream of activity requiring less attention and less energy than each of them performed separately.

[1] *Creative Intelligence*, p. 237.

We are able to respond to a progressively complex situation as integration progresses. This means that we do not respond to all the specific qualities of the elements included but to the properties of the new unit only. When we respond to an object we do not respond to its colour and shape specifically but to the object as a unit in its functional relationships. To borrow an analogy from chemistry: HNO_3 dissolves silver, but the dissolution is not a response to the properties of hydrogen taken by itself, or to the properties of the other two elements, but to their combined properties in the unit HNO_3.

Generically viewed, one activity grows out of the previous one. Elementary functions integrate so that they contribute to more adequate functioning on a higher level. Walking along the street can be either an activity by itself, or it can be taken up in the more comprehensive unit of going to a certain place. In the latter case, walking, though no less behaviour and no less a functional adjustment towards environment, is re-directed and remodified by the demands of that higher unit of behaviour. Integration of specific activities and of specific elements of behaviour has a liberating and a creative power.

The role of progressive integration becomes especially apparent on the level of the higher mental processes. Consciousness itself is a result of such progressive integrations of the lower organic activities. It is the result of the accumulation of specific responses and the refinement of senses through that process. We talk of consciousness when events are not responded to as immediate, but where they are responded to as having relation to past events and are indicating future consequences. In the case of consciousness, organization proceeds not only along the lines of co-existencies but also along the lines of sequences.

The progressive complexities of patterns in the course of development are the results of progressive integrations of the most elementary processes, and feeling and thought are not superfluous additions to the mechanism of reflex patterns but reflexes in new integrations, and consequently

on a new level in behaviour activity. Just as the highly integrated organic processes produced reflexes, so the highly integrated reflex actions bring about a phenomenon that we call intelligence—not by any mystic force, but because of systematic interdependence. We know from everyday experience that a group can accomplish co-operatively what none of the participating individuals can perform singly. Thus, using a crude analogy, we can quite see how progressively integrated functions can accomplish more than their elements can singly.

There is one aspect of the patterns of integrative behaviour that methodologically is very important, and that is that these patterns are essentially time patterns. This does not merely mean that time is required for their completion; they involve time as a differentiating factor, time as a creator of history. Behaviour is a cumulative pattern where single partial acts or segments can be explained by the traditional category of cause and effect, but where the same category is insufficient to explain this cumulative sequence we call behaviour, because such a category stands only for what is more or less overtly present in the act, not for the effects of past sequences, or for those sequences themselves. To explain any segment of behaviour the direct causes, as, for instance, sensations, are sufficient. But larger, meaningful behaviour units have direction; their particular acts are determined by direction and also by what happened in the course of following that direction. They have a determining history. Consequently, it is methodologically wrong to try to construct a pattern of an extended behaviour unit by what has been discovered in any of its single segments; yet this is an accepted procedure in atomistic psychology.

One can say that the cause for the sensation red is in the stimulus red, and consider that an explanation; but for the explanation of behaviour we need to know not only this particular reason for the sensation red, but also why this sensation among many others possible—and that refers us to the past and to the future of behaviour process

of which the sensation red is an element—was noticed and sensed. Always we are confronted by an infinite multitude of stimuli—yet our behaviour shows that responses are not made haphazardly to any one stimulus of that multitude. Our responses are made in an orderly way, showing a certain selection and a certain pattern. Any attempt to explain behaviour should find this pattern just as serious a problem for consideration as is the relation of particular stimuli within the sequence to particular responses.

VI

The factors determining events in general can be classified in two groups. Among the determinants of a process and involved in the dynamics of that process, one can discriminate factors that are more or less constant. Chief among the constant factors are the materials entering the process. The specific qualities of protoplasm, and the structure of the organism, determine on the biological level the kind of functions the organism is capable of performing. A second important group of constant factors comprises the constant elements of the environment. Thus, for instance, temperature and sunlight, varying more or less to be sure, are general abiding environmental factors of all living processes; the setting of civilization and culture form similarly general abiding factors for groups of human beings; and so on with lesser degrees of constancy coupled to lesser degrees of generality of effect as we proceed. In the setting of all events, or groups of events, we find such relatively constant factors.

In the case of nervous currents, the nervous system and its structure provides the general topographical conditions for all types of nerve currents, and thus forms a constant condition for all functions, feelings, thought, reflexes. To the degree that constant functions are present, the processes manifest a certain stability, a certain identity of function.

Beside this group of abiding factors we find the second, made up of conditions that are determined by the actual play of forces at each and every moment of the process. Thus the nerve current and its particular mental result are determined by certain dynamic relationships between the perceiver and the object perceived as well as by the constant factors already referred to. These dynamic relationships are formed at the moment, as the process continues. While looking at an object as a whole, different aspects of it are accentuated on the background of the whole, and these accentuations are reflected in the responses, which in turn work to accentuate some other factor or aspect. The final mental deposit is a result of such a dynamic sequence of processes, in which each preceding event is partly determining the subsequent one. The response made at the first moment determines in part the aspect that particularly determines the response in the next moment. Thus, looking at a book on a table, the subject, by some peculiar position of the book, may be led to notice that it is open, that it is among other books, that all of them are of specific content, and then to notice that the book is one of the books that a friend of his had used last night for an article. The same book as a stimulus has led to a whole sequence of perception and thought processes during which each step was determined by what happened at the preceding moment.

We can observe that events are interactive not only in relation to other simultaneous events—a book in relation to other books—but also in relation to preceding ones. The looking-at-the-other-books is first determined by the looking-at-the-first-book, and this step could be referred back to the fact of, and reason for, entering the room, and so on.

This process, to be sure, is a determined one, but determined only as the actual dynamic situation develops the next event out of itself. The particular result of looking at a certain object, while itself determined by what happened before, determines whether some more

looking is required, or whether grasping or avoiding or something else is to be the next act. Thus any reflex arc, while depending on the general structure of the organism and thus generally predetermined, is being built while the act proceeds, as a specific resultant of specific changes in the situation, which again, it must be pointed out, includes both the perceiver or agent as well as the thing reacted to. Both elements effect changes in each other in a pattern of circular response.

The order of the situation thus progressively integrated is made up partly from order ante-dating the particular experience, partly from the order evolving in such a process itself. The environment-object relationship thus makes a system that is orderly in its inter-relation and sequences, but which is not a fixed structure. It is rather a growing structure, where there is a constant flow of interchanges between both parts. What was purely a dynamic factor on one occasion becomes a structural one on the next. What was an environmental factor in one event becomes an organic factor in the next. It has become incorporated into the structure by having effected changes in it.

In this way there are two functions—the adjustment to, and the creating of, the situation—going on at the same time. Determination has usually been understood as a category of fixed external conditions of which adjustment is a functional counterpart on the side of the experiencer. Determination, if conceived as a progressive integration, would combine both mastery and adjustment as functional parts of the same process. Man is within two systems of order and causation. One results from inorganic powers, powers of nature in general, and from the constant or relatively constant factors within systems created by himself, such as social structure. These, though suffering modification over longer periods, are taken as more or less given in any single behaviour act. The other system of causation is formed by the organic relations within the process of organic becoming, by which he is influenced, and which he himself also influences to a great degree.

"Interdependence in the ground of universe is constitutive, interdependence in the organic system is an interdependence of process and structure."[1] Structure and process, in the form of a circular response, determine each other on successive stages. What is function at one moment becomes structure at the next. Not only do structures determine processes but processes also make structures. The organism-environment interdependence thus shapes itself so that an organism by changing its structure is able to respond to a more comprehensive environment, and at the same time, by being able to do so, effects changes in that environment. Organic experience adds the deposit of dynamic developments of one event after another to both the structure of the organism and to that of the environment.

The determining power of the abiding or dynamic factors depends on the type of situation and participating organism. In the case of the behaviour of lower animals, the abiding conditions as represented by the structure of the organism and the abiding conditions in environment prevail. In the case of very simple organisms, the number of "specific responses" (responses made to the organization of stimuli and responses themselves) is very small, and therefore their behaviour is closely dependent on a few constant factors stimulating them. Their relation to the environment is adjustment rather than creation. Humans are capable of more refined sense perception. They are capable of a greater number of varied responses. They are therefore capable of more numerous organizations in the process between stimulation and response. Consequently, the constant factors at both ends of the process, namely the stimulus and nerve organs, are relatively less numerous and less influential.

"Mentality" is further development within this refinement and sensitivity. It is due to man's greater ability to produce many types of environment constructively additional to those physically given. He is thus able, as experience proceeds, to respond to an environment or

[1] Noble, Edmund, *Purposive Evolution*, p. 340.

environments ever increasing in their range. Man responds not only to temperature and light, to the objects of the physical environment, but also to meanings, ideas, hopes, beliefs, and feelings. These are mental deposits formed by the process of experiencing itself. They are not determined by any immediate constant factors in the physical environment or in the organic structure of the organism.

Within the range of human behaviour itself there are differences in the type of determining factors. There are numerous behaviour acts almost completely controlled by the nature either of the stimulus or of the topographical conditions of the nervous system. Yet in the totality of human behaviour such acts are relatively unimportant, as most of them do not occur independently but are parts of larger units, subject to differing conditions. In the case of man, behaviour is determined predominantly by the dynamic processes happening between the initial stimulus end and the concluding response end of the stimulus-response circle. The stimulus itself (understood as a single, determined one) as well as the topographically determined initial response are but starting points. The rest of the process is carried on by the dynamics of the process itself. Thus man and higher animals largely create their stimulating situations themselves. And as from the functional point of view the totality of stimulating situations constitutes the environment, we can say that man and the higher animals create their environment. They master their environment instead of merely adapting themselves to it. But that mastery is not to be understood as perfect control by the organism. It is not the organism as an independent unit that is the master. It is the dynamic relation between the environment and the organism, the effects of which cannot be completely controlled by the organism alone.

That we need knowledge for the purpose of prediction and control is an accepted premise of the scientific school. Understanding in general is not sought for the sake of the understanding itself (though one must give credit for

such *l'art pour l'art* spirit in individual investigation), but in order to gain better control and a wiser management both in life and in thought. Such better control is not possible without prediction. It would be impossible to control anything that is entirely precarious and at the mercy of chance. On the other hand, it is dangerous to make a fetish out of exact prediction and perfect control, because perfect prediction is possible only in a perfect mechanism working under precisely limited conditions. Nowhere in organic nature do we even approximate to such a perfect mechanism, except as created by the human hand, in which case both structure and topographic conditions are artificially controlled. Exact sciences have prided themselves on the exact predictions that their knowledge has enabled them to make, but the latest developments in the field have shown that they are still far short of their aim. Heisenberg's principle of indeterminacy indicates that prediction in the realm of the physical sciences is possible only within the limits of probability. Thus, for instance, the motions of the last elements, namely electrons, can be predicted only for great numbers, but not for any single electron at any given moment.[1]

The structure of human behaviour is much less mechanistic than that of physical events. Consequently, it is natural that it should offer less hope for exact prediction or for strict control. But in the case of human conduct, when importance should not be put on the regularity of patterns and the control of behaviour in terms of regularity, but on their value and richness, the question is not only one of the possibility of control and prediction, but of the desirability of such control and prediction. We must ask ourselves whether exact prediction is not a delusion on the part of the human sciences, and whether by trying to achieve such a standard, we are not imposing the primacy of an alien method and of a standard created by such an alien method.

[1] Cf. Eddington, *The Nature of the Physical World*, pp. 220ff. Bridgman in *Harper's*, March, 1929.

On the other hand, we must not forget the double function of human behaviour; that it not only dictates the categories to the method of its study as any other subject of study does, but that it is also influenced by the outcomes of the studies thus conducted. In the field of social and human behaviour, our notion of how things happen has a kind of backstroke on further occurrences. The course of prediction is followed by the course of events, and any limitations of the prediction will leave an impression on the resulting events. By predicting certain events, a step is taken towards producing those events. By analysing life as having a mechanistic and strictly predictable structure of events, we contribute towards making life more mechanistic. If a schoolboy is told that his I.Q. is mediocre, and that because of its constancy he is incapable of superior intellectual work, the information will actually contribute to such an intellectual limitation by discouraging the boy's efforts along certain lines of mental activity.

Because of this backstroke, because of the dynamic nature of behaviour possibilities, there is danger in any attempt at the strict prediction of human behaviour, individual or social. Prediction is based on the assumption that the future is computable from the present. In the case of human behaviour, the realization of such prediction will, to some extent, make the future more like the present.

An analysis of human behaviour shows that there is no strict recurrence of behaviour processes.[1] One can say,

[1] Thorndike seems to postulate a theoretical possibility of strict recurrence and accurate predictability of human behaviour. In his *Educational Psychology, Briefer Course*, p. 6, we find the following: "It must not, however, be taken to mean that the result of an action set up in the sensory neurones by a situation is essentially unpredictable—that, for instance, exactly the same neurone-action (paralleling, let us say, the sight of a dog by a certain two-year-old child) may lead, in the two-year-old, now to the act of crying, at another time to shy retreat, at another to effusive joy, and at still another to curious examination of the newcomer, all regardless of any modification by experience. On the contrary, *in the same organism the same neurone-action will always produce the same result—in the same individual the really same situation will always produce the same response.*" The italics are Thorndike's

of course, that given a certain character and certain abilities one can expect a certain type of behaviour, and knowing the former, can predict the latter. Yet we have to admit that ability, or character, or native tendencies are only partial factors determining behaviour. Our present character traits, tendencies, and capacities are not mythical properties of our inner self, but the results of dynamic relationships between the more or less constant structure we call self and environment. Therefore, if the usual balance between the determining factors is upset, if some peculiar combination of events occurs, we can expect a reorganization in our functionings, mental and physical, with a resulting change in abilities and capacities. Because of the emergent characteristic of this relation in organic behaviour such an upset of the usual balance may be brought about by something that is apparently quite trivial when considered previously to the event itself.

A condition of strict recurrence is out of the question in the becoming process, where each particular event is contributing to the change of the total pattern. Yet it is also wrong to describe the becoming as entirely precarious and unpredictable. As we stated earlier, exact prediction would be possible were we able to know what factors would be entering the experiential situations and the way in which they would become organized. These we cannot foresee completely in any organic process. However, progressive integration, although productive of new patterns, weaves itself around a common structure of continuous development. Consequently, anything new is an outgrowth of the events of the past and has a certain direction towards the future. The radical differences show themselves only if the properties compared are taken on radically novel stages along the line of progressive events. Progressive integration is a continuous process, where every new event grows out of the preceding, the whole showing a definite pattern. To the extent to which the commonness or continuity of pattern is present, prediction is possible.

The future is not exactly computable from the knowledge of the past, because it will always be different to a certain degree. It will have some quality of its own, some patterns of its own, which did not exist in the past. Thus the past can serve only as a clue to the prediction of the future, not as an exact chart. What we know about the behaviour of a child in the first grade cannot be used as a basis for an exact prediction of that child's behaviour in higher education or in after-school life, and consequently we have no right to map out his possibilities and restrict his experiences on that basis, as is so often done in present school practice. There are always possibilities that some hidden potentialities will spring into actuality under favourable conditions. The nature of those possibilities, as well as the exact nature of the favourable conditions that will evoke them, cannot be foreseen before they have actualized themselves to a certain degree. Therefore, safety lies not in mapped-out control, but in variety and freedom of experience combined with a certain amount of control.

Our purpose in studying human phenomena should not be to secure strict control but to attain intelligent understanding and a method of adequate analysis that will help to solve problems as they arise. Exact prediction of problems is as undesirable as having "adequate techniques" ready for their solution, since both imply a limitation of experience. It is scarcely profitable for us to be limited to our existing forms of experience by predicting those to come and controlling them from the standpoint of the present. The fertility of experience depends on the growth of problematic situations, and on the ability to use new judgment for their solution. Life's most valuable aspect is its progressiveness of change and its ongoing. Our efforts should therefore be directed chiefly towards the liberation of energy, towards productive capacities, and not towards their mere control, because such control implies the establishment of recurrences and similarities. To be able to predict the outcomes of educational efforts and to control those efforts

thereby means to produce something that is completely limited by the existing type of culture, the existing scope of thought and feeling. To be able to predict the type of citizen that will be produced fifty years from now, and to be able to produce that type, means to check the possibilities of progress by the limitations of the concepts now current, or of ideals that are highly valued today. The essence of good life includes its unpredictability and its forwardness, the newness of its patterns and the individuality or uniqueness of its relations. And this is possible only if the details of the course are left open and are not strictly limited by any pre-conceptions.

This does not mean that one should not foresee human conduct at all. It only means that predictions should be made in terms of liberation and of progress, and not in terms of limitations. It means that both the prediction and the control should be alert to the appearance of new possibilities. It also means that the attempt to control should cover general directions, not fine exact outcomes. The absence of exact prediction and strict control does not abandon human affairs to blind chance, or imply lack of all management and conscious direction. The very integration which produces change also produces the patterns of that change. Events social as well as natural form systems, and systems as a whole change at a lesser rate than their parts. Change is relatively slow when looked at from the standpoint of a larger system. Even a radical social change, like the one taking place in Soviet Russia, seems to offer but slight variations when viewed in the light of our entire human civilization. It is only in smaller particulars that we are able to see something completely new.

Chapter IV

PURPOSIVE BEHAVIOUR

I

In the previous chapter we have seen that human experience, viewed through the manifestations of conduct, reveals a definite interdependence of all acts of behaviour, however elementary. Human behaviour, it has been stressed, is not an unorganized aggregate of isolated functions, forming units only under the pressure of outside forces. Even the elementary manifestations of the human organism are essentially interdependent and interactive. They form systems in which the constituent parts function differently from the way they would function when in separation from each other, and manifest properties not found to be theirs when they are operating in isolation.

It is due to such interaction that single events, single behaviour acts, are woven into unifying patterns with definite meanings and directions. It is the same factor of interaction that is productive of the emergence of new patterns of behaviour, and correspondingly, of new structure in the environment as well as in the organism. All organic and psychological functions, through the reorganization of their functioning when in interaction with each other and with outside forces, liberate energy and productive capacities.

Purposive behaviour, the subject of our present chapter, is a manifestation of human behaviour in which such flexible and emergent patterns and such reorganization from within are most prominent and apparent. In purposive behaviour both the behaviour itself as well as the situations in which such behaviour takes place are re-modelled according to the direction and needs of that behaviour.

Experience has been described by John Dewey as a process of acting and undergoing. Man is controlled by and at the same time is controlling nature outside him and within him. He is a source of activity, yet is himself activated by other sources. He is responding to his environment and at the same time, through selective choice of what he responds to, and through the influences of those responses on environment, is imposing his will on environment. Experience is both an adaptation to environment and a re-creation of the same environment through the re-modification of responses.

Purposive behaviour has come to mean that part of experience that reveals control, selective direction, and, in general, a degree of autonomy on the part of man or organism. In purposive behaviour the responses are not solely activated and directed by the nature of the external stimulating situation. The stimulating situation of a behaviour act contains what preliminarily might be called the will of the organism as well as the demands of the act itself striving for an appropriate termination.

In the purposive act the determining forces are threefold: inner, external and inter-relational, the latter combining the first two. The responses are not activated and co-ordinated by external stimuli only; the organism itself, as well as the structure of its preceding acts, determines what responses are to follow and in what form and sequence. The partial responses and steps forming a purposive act are not taken on their own behalf nor on behalf of their direct stimuli, but in reference to something else beyond them, both in the direction of the past experience as well as in the direction of the coming one. That something else, which retrospectively and from the standpoint of a finished act could be called a goal or end-in-view, sets all the intermediate and partial acts in the status of means towards that goal, whatever the definite nature of that goal may be.

Thus the order and sequence of partial acts and responses are not determined only by direct cause and effect relations. Each succeeding act does not have its

root in the preceding one only. The full cause of any single and definite act is to be found in the sequences of behaviour, in which both the past experience as well as some anticipation of the experience to come figure as important elements. This integration of past experience with the future effects would give us a right to talk of a future cause in relation to purposive behaviour. And this same integration gives all purposive acts a characteristic of apparent intelligence, regardless of whether or not the organism involved in such an act might be called intelligent.

This combination in purposive behaviour, comprising an undergoing of experience as the result of external stimulation together with the direction of behaviour from within the process itself, which latter aspect gives it an apparency of self-direction, has made the question of purposive behaviour one of the most crucial problems in psychology of today. The position taken in reference to this issue decides one's attitude towards all of the major and vital problems of the intelligent and creatively ongoing experience, such as growth, learning, intelligent self-direction and choice. The interpretation given purposive behaviour decides whether human experience is to be regarded as a passive mechanism subject to the stimulation of its environment, a product of godlike "free will," or a process in which the creative determination of the course of activity is derived from both intelligent adaptation to environment and a creative re-modification of the same by the organism, the will of which is a product of the intercourse between itself and what surrounds and stimulates it.

Unfortunately, it is precisely this phase of behaviour that has received the least psychological attention.

Purposive behaviour has been understood and defined so as to limit the selectively directed acts only to those that receive such direction from consciously and intelligently formulated purposes. The presence of a conscious purpose, and not the structure of the process itself, has been used as a basis of discrimination between purposive

and mechanistic behaviour. Thus, the divine " free will " and the total autonomy of man in directing his behaviour has been introduced, though not in the glaringly speculative way employed by the free will schools of the past. And as purposive behaviour thus understood would cover only a minor part of human behaviour and none of animal or organic behaviour, a mechanistic principle for the understanding of the rest of behaviour has seemed not only appropriate but even imperative.

Thus we have two opposing schools of psychology of purposive behaviour. One sees a self-direction on the part of the organism in the form of a definite intelligent purpose, but is only able to extend this explanation to cover satisfactorily a minor part of all human behaviour. The other school sees in such an explanation, especially in the purposive aspect, a certain psychological abstraction and illusion, and consequently tries to dispose of purpose and purposiveness as secondary phenomena arising from the peculiar combination of stimulus and response mechanisms. This position maintains that purposiveness and consciousness, as categories of psychological explanation, are fruitless and misleading in a scientific approach to the phenomena of human conduct. It tries to avoid these concepts and replace them with the categories of stimulus and reaction in their delayed form.[1]

The interpretation generally given to purposive behaviour has justified some of the derision expent by the sustainers of the so-called scientific method in psychology. The interpretation has concentrated on the concept of conscious purpose as a central idea, and it has derived the characteristics of purposive behaviour from the structure of acts performed in reaching a definite end-in-view or goal. This goal is supposed to be formulated before the act itself, and to serve as an activating source and directive force to that act. The specific and intermediate steps and responses in a purposive act are held to be dominated and selected by the purpose, which itself is not greatly effected by the organization and the

[1] Symonds, Percival, *The Nature of Conduct*, pp. 297-8.

outcomes of those intermediate steps. The purpose is conceived to spring from sources different from those motivating the activity itself, and thus a definite dualism is introduced between the goal and its actual realization. The first is regarded as an inner factor, very often a mental one; the second is a mechanism of inter-relation with the external. Thus goals are set up from without the continuity of the process itself, and their evolution and growth are subject to laws different from those of the activity that achieves that goal. In other words, the order of the purposive act is imported from without, and does not necessarily subordinate itself to the intrinsic continuity of the preceding behaviour. Within any purposive act the purpose or goal is statically fixed, in the sense that it does not require the completion of the acts performed towards reaching it for its evolution or final formulation. The goal and the activity towards that goal are seen as two distinct units operating independently of each other.

A dualism such as this has been especially convenient for the general intellectualistic background producing this interpretation of purposive behaviour. This theory has not concerned itself with ordinary experience in its full actuality. It has covered only those aspects of behaviour in which intellectual thought and planning are prominent. Likewise, it does not concern itself with goal activities in general, but with what may be called aims and ideals—that is, goals on a plane where intellectual thought and criticism participate. Approaching the total field of purposive behaviour with such a background, this theory has taken the structure of intelligent (really intellectualistic) aim activities as a basis for understanding and discriminating all purposive acts. The intellectualistic and dualistic conceptions current in the theories about mind and body, thought and activity, have easily worked themselves into the efforts to understand purposive behaviour, and have produced a similar dychotomy of mind and body, thought and activity, and other such segregations in this field.

The segregation of ends and means, or purposes and purposive activity, is especially apparent in views on the role of general social purposes or moral ideals. Here sharp distinctions are introduced between everyday experiences and whatever mental deposits they leave, and the lofty ends promoted by thinking on some higher plane, as if the latter had a subsistence of its own, independent of experience on the lower plane, and as if the ideals sprang from a source different from that of the ordinary experience. The roots of ideals are supposed to be in some higher faculty. They are supposed to generate on some higher plane of moral thought instead of being considered just as projections of certain aspects of actual experience. As a result, ideals are looked upon as a *deus ex machina* in the process of re-shaping experience, instead of being considered a product of that very process of re-shaping.

Still another type of segregating dualism is introduced when the factors activating behaviour are classed as "inner" and "external." Purpose or goal is supposed to be an inner factor, meaning something that belongs to the subject end of the behaviour process, whether in the form of an aim, will, or an innate tendency or drive.

"Purpose," says Woodworth, "is an inner drive that sets man busy."[1] And generally by purpose is understood "all internal factors that govern behaviour." Thus a division between the inner and external factors in behaviour is set up with the primacy as to activating force bestowed upon the inner ones. Behaviour is split up in two independent types of processes, those emanating from the subject and those activated by external stimuli. Though generally the influence of external factors, i.e. environment, is admitted to be a generic factor in the production of such inner drives, in the analysis of any act these two sides are made to stand in isolation and in a sort of opposition to each other. The role which the interaction of the organism with its environment plays in creating purposes is thus looked upon as a secondary one,

[1] *Psychology*, p. 72.

and is not emphasized in any way in an analysis of any purposive act. Such a point of view is productive of many harmful misinterpretations of the processes involved in purposive behaviour. In the first place, the means and ends are segregated as phenomena belonging to two different types of experience. Thus it is made methodologically impossible to deal with purposive behaviour as a unified continuity of correlated and integrated acts. A gap is introduced within the purposive act itself and also between acts clearly purposive and those that go to make up the balance of behaviour. One group of activities is moulded and directed into meaningful sequences by a controlling purpose, whereas the other is comprised of acts devoid of any organization and appropriateness save for chance formations due to past experience, which do not yield to re-modification in face of the demands of a new experiential situation.

Secondly, the generic source of activity is laid either to the inner drives or to the external situation, either setting a supposedly inert and passive organism in action. The process of experience itself, as a totality of all acts, is not supposed to be able to further intrinsically its own continuity. There is nothing in the process of behaviour itself leading on to further activity and to abler control of that activity.

The inability of current theories of purposive behaviour to cope with all phenomena that are apparently purposive from the standpoint of ordinary experience, has given rise to a mechanistic explanation of human behaviour, in which purpose and purposefulness are reduced to secondary characteristics concomitant to processes, themselves not purposive or in any way directed. Purposiveness according to such views is an apparency, brought about by sequences of behaviour resulting from the mechanization of sequences of responses made to repeated sequences of stimuli in past experience.

Original human behaviour is held to be an aggregate of all kinds of miscellaneous responses to all kinds of stimuli, which later, through the repetition of certain

successions and spatial co-existences, as well as through the elimination of all responses that have proven annoying, become conditioned, that is, grouped as a series of bonds and connections, and thus give behaviour an appearance of selection, directedness, and appropriateness. A stimulating element in a given situation, we are told, merely touches off these mechanisms, which then follow their fixed course, without any important reorganization or re-modification. We grasp balls and throw them at our partners because, due to past experience, a moving ball has become a stimulus for grasping and throwing. We go to the theatre apparently because reading theatre advertisements sets off activities connected with theatre-going. And we respond to a word in a sentence according to the emotional connections set up in the past and independently of its present connection. A dog answers a whistle because the whistle "starts off something in its neural mechanism," etc.

Thus the order and sequence of responses in the behaviour act in any given situation are not determined by the meaningful and dynamic adaptations of the responses to the needs of the situation, or to the total course of the activity, but to connections established in past behaviour. Behaviour thus becomes a rigid mechanism, devoid of intelligent self-direction.

This explanation gives a primacy to the environment over both the acting organism and the particular sequences and meaning of experience. Experience is not viewed as a self-directing and meaningful process, vitally integrating the factors of developing and changing situations, but is seen as a sort of ready-made mechanism, controlled by the fixed nerve bonds created by some single, isolated stimuli in the past experience, devoid of any meaning and devoid of flexibility.

This theory, by denying flexibility to behaviour in purposive acts, denies intelligence not only to the actions of "unintelligent" organism and animals, but also to those of human beings.

Both extreme positions are similar in that they ignore

the creative and integrative nature of human behaviour, capable of directing its own course even if a consciousness of a definite end to that action is lacking. Both of them overlook a continuity in the reorganization of behaviour that is the result of the cumulative integration of past responses with the change brought about by their participation in new situations. In the first case, this integration is replaced by a strict sequence dictated by a preformulated and projected purpose. In the second case, it is replaced by a mechanism of nerve connections and bonds. The meaningful and directive interaction of the subject with the situation is lacking in both, and therefore both of them are introducing dualism and statics into behaviour. And both of them see purposiveness as an externally introduced characteristic, not as an intrinsic quality of the process of behaviour itself.

II

An impartial observation of everyday experience shows us that behaviour is continuous in the sense that every single act has some definite meaning and place in the total course, with reference either to the preceding or to the coming acts. We do something in order to do something else or to complete what was done before. Our behaviour in most cases is selectively directed, because from the multitude of possible stimuli only a few are responded to and from the multitude of the possible responses to those stimuli, only those of a certain type come to actualization. One act follows the other in an onward pushing sequence, a sequence that has more to it than a mere temporal succession, as one act grows out of the other. When such behaviour is observed retrospectively, certain responses and acts could be designated as means, as transitory, as having no specific value in themselves, certain others as ends, as final ones.

Such behaviour can rightly be called purposive. Yet on analysis we should look in vain for a definite purpose at the outset of every act, or even at the outset of a larger

unit of that behaviour though retrospectively one would not fail to see some sort of purpose in it.

This indicates that the basic characteristic of purposive behaviour is not in the presence of a definite purpose but is to be found in a certain structure of the process itself. Consequently, to understand purposive behaviour the process itself, not the purpose involved, needs to be investigated. This approach through the process prevents an arbitrary and predetermined limitation of purposive behaviour, and allows its unbiased understanding.

The task of the following discussion, therefore, is to look into the structure of behaviour that can be called purposive, to analyse characteristics that are fundamental to such behaviour in all its modes of appearance, and on this basis to see what role it plays in human activities in general, and what implications one would draw from such behaviour for the conduct of our education.

The antithesis to purposive behaviour is considered to be mechanistic behaviour. What is it that distinguishes purposive behaviour from mechanistic behaviour or reflex behaviour ?

One of the principal distinguishing features is the absence, on the part of mechanistic behaviour, of an inner organization controlling the course of activity as a unity. Physical forces behave according to certain stresses and influences ; their sequence is determined by the play of these stresses, without any regard to the events that have preceded or that are to follow. Physical forces do not organize themselves, they are organized by these stresses. The same can be said about the purely reflex behaviour. It is organized by the sequence of stimuli, and that sequence, though not as a rule devoid of any organization, is accidental in its character and external to the act itself. The organization is not done in terms of the whole course of action ; it is without any reference to the outcome, without any reference to the preceding events.

Purposive behaviour, on the other hand, is organized from within the process ; it follows a certain direction, in

which partial acts contribute cumulatively to the final result, and which renders unity to all single acts. If some obstacle is introduced into the course of action, mechanistic behaviour reacts to it through the ordinary course of action: it either overcomes the difficulty with the same pattern of activity, or the activity itself is stopped. No attempt is made to re-modify the course of activity for the sake of overcoming the difficulty and in order to maintain the activity in its own course. A blunt illustration of this is found in the physical field. If a rod is introduced into the workings of a machine, the rod is either broken or the machine is stopped. Mechanistic behaviour maintains itself through rigidity, purposive behaviour through appropriate flexibility. Such flexibility ranges from the simpler adaptive behaviour to the more complex that might be called creative behaviour. Organisms, capable of purposive behaviour, meet a difficulty or a novel situation in the course of their behaviour by effecting such changes in their behaviour as promise to preserve its integrity. Purposive behaviour deals with a new situation by employing new responses created within the situation itself.[1]

As is true of directedness in behaviour, purposiveness is also a characteristic of a unified series of behaviour acts, not to be observed in any individual act by itself. Thus purposiveness, and even intelligent adaptation, are phenomena which cannot be detected by an atomistic approach. Noble has very aptly described this aspect in discussing the teleology of natural events:

"So long as our attention is concentrated upon the individual case of action-reaction we fail to realize anything more

[1] There is a certain danger in contrasting the purposive and the mechanistic in human behaviour. To be sure, after a purposive act has been completed we can, so to say, discover its *mechanism*. There is a mechanism in all purposive acts. But this is different from asserting that purposive behaviour is mechanistic. A mechanistic explanation means an explanation of behaviour where responses to stimuli are made in a haphazard way, in the succession of the appearance of the stimuli, or in a sequence which is predetermined by factors external to a given situation. The mechanism of purposive behaviour is formed in reference to present situations. It can be discovered after the act is performed, but it is not predetermined.

than the simple process by which, through motion differential stress passes over into equalized stress. The mind which busies itself solely with the unit—with the atom, the molecule, the cell—cannot be expected to find in any of these the meaning of 'intelligent adaptations' within the organism itself. Teleology in both organic and inorganic emerges from and requires, not only plurality, but more or less of unity for its manifestations: it is a product, not of the individual unit, but of the system of units; it arises from the potencies of all of them and yet is no mere summation of all those potencies; involve as it must the contribution of each to all, it is the dominating guidance of each by all."[1]

There is nothing then, in any single behaviour act to suggest purpose or selective directedness, because these are what previously we have called supra-local qualities. They are qualities of organized acts, and not characteristic of the acts or events in isolation. Any single act can be explained mechanistically as a response to a certain discrete and direct stimulus. Thus, if in the behaviour of an animal using a stick to reach food outside the cage, we isolate the act of reaching-for-the-stick from the total activity of the animal, we can rightly say that the animal is responding mechanically to the stick. Yet the observation of the total behaviour of the same animal very easily shows us that the stick has become a stimulus for the animal only because it is seen as a tool in relation to the food outside the cage. The response to the stick, when viewed as an integral part of a course of activity, is seen in a different light, for which a mechanistic stimulus-response explanation does not suffice.

As the purposiveness of behaviour can be observed adequately only in sequences of acts and not in the analysis of single acts the behaviourists, approaching human behaviour as a series of isolated responses independent of the total course of activity, have been unable, precisely because of this, to see anything purposive in human behaviour. And for the same reason current

[1] *Purposive Evolution*, pp. 347-8.

theories of purposive behaviour have been compelled to limit purposiveness to the consciously purposive behaviour act only.

The same directedness, which evolves the quality of purposiveness, also creates what in the total unity of the behaviour act could be called a goal. This goal may be either an object of the environment, or some inner state of the organism itself, or merely a satisfying course of activity, of which the entire organism may or may not be conscious. A fish avoiding poisoned water, a hungry animal seeking food, labourers fighting for higher wages, a ball player trying to catch a ball—in all these acts, the series of single acts is organized in reference to something which, though inherent in the whole process, is somewhat beyond each single act. All such acts are goal activities, they are directed so that they eventually lead towards some form of final outcome, whether this final outcome in its concrete aspects is explicit before the activity started or not.

In all these cases the goal is nothing definite outside of the activity itself. Neither is it something external to that activity. It is the behaviour itself that produces it and evolves its particular nature. Avoiding of tainted water becomes an aim after the tainted water has become a factor in the behaviour of fish. Food has become a goal for an animal, because hunger upsets his inner organic state. The acts undertaken as goal activities are but "terminations of what has preceded." The final act of reaching the goal, which ultimately expresses the goal, serves only to finish and summarize the total behaviour, although each of the preceding acts has contributed to that final act and consequently also to the formation of the goal.

It should be apparent that the purpose or the purposiveness is neither in the organism nor in the environment, separately considered, but evolves in the process of interaction of the organism and its environment. Behaviour becomes purposive not because of inner drives or the presence of some external factor as such, but because of the integration of the inner drives with the environmental

situation within the continuity of preceding behaviour. Consequently, in order to analyse purposive behaviour adequately, one must analyse that "activity between" the organism and its environment in its special directedness and structure, which eventually evolve the purpose or goal.

For the sake of clarity, and to facilitate discussion, a distinction should be drawn between the subjective and the objective purpose. The subjective purpose is the "inner factor," whether in the form of an inner drive or of a conscious purpose, which, though itself a product of previous behaviour, is prominent at the starting point of a new behaviour act. It is the "intended purpose" in the case of a conscious act. Objective purpose, on the other hand, is the purpose as it evolves during the process, and as it can be seen from the logic of the behaviour itself. The subjective purpose can be present before the act itself. The objective purpose is fully actual only after the activity is brought to some kind of termination.[1] Subjective purpose can be attributed to the organism. Objective purpose is neither in the organism nor in the environment. It evolves in the intervening activity between those two poles or points of reference of behaviour. And that intervening activity is directed by factors to be found partly in the organism, partly in the environment, and partly in the structure of the activity between the two.

All specific responses within the purposeful act receive a specific quality and mode when integrated in that act. A typical mechanistic description of the responses included in a purposive act is unqualified. It is usually done in the following terms: the responses of a ball player may be "grasping," "throwing" and "rolling." But even a superficial analysis of ball playing should reveal that the responses cannot be stated in terms of grasping and rolling and throwing, but that these are grasping in a certain way, throwing to a certain person with a certain speed and at

[1] As behaviour is constantly continuous and is not composed of definitely segregated units, one can refer to the termination of any one act only in a relative sense.

a certain angle, and rolling at a certain time. All these responses are not fixed either by the previous experience or by the " aim " of the game, but they conform to the demands of the situation of play as it develops. They are qualified in reference to the situation as a whole, in reference to its developmental organization. While themselves directed by the situation, they evolve the objective purpose of the play. The original purpose might be fair play, or winning, or a fast game, or an easy game, a purpose that might be established at the beginning of the game. But the form that these original goals actually take depends on the nature and the organization of sequences and outcomes of those different modes of responding. The goal thus is an integral part of the situation of playing, of its development, and of the ideas of the persons participating in the game about that development ; it is not antecedent to it.

Within this directed structure of behaviour, the successive acts become organized as means and ends. Each preceding act serves as a means to the other, and each preceding act contains some contribution to the reorganization of the whole course of activity. This division of acts and events into means and ends cannot be made *a priori* and independent of the situation in which they occur ; this organization is done on the spot and in view of the total situation and of the goal evolved in that situation. There is nothing in any act in itself which would make it fall in a class of either means or of ends. All specific acts acquire their status of means and ends as parts of a directed course of action, which is proceeding from one end to another and from ends to means and means to ends. Means and ends do not denote any private and constant characteristic of any act or object. These attributes are relative ones. The terms indicate only that in a certain course of action, or in reference to a certain goal, some acts acquire the status of being necessary antecedents to the other, and that their fulfilment is an essential condition for the fulfilment of the other. Endness, meansness are produced and distributed by the

process that we call purposive, and not altogether by the premediated purpose or end-in-view. Thus, in the act of climbing a fence in order to reach an apple, the act of climbing the fence, an end in itself, can be regarded as a means only because it is regarded with reference to that of reaching an apple and becomes a means only in that particular reference and temporal succession.

This organization of partial acts as means and ends changes as the whole situation changes. The means and ends succeed each other, and are reversed as the reorganization of stimuli and responses included in, and produced by, the situation proceeds. Such reorganization is made on the spot, at the moment of the actualization of the purposive act. It was stated previously[1] that in the process of reacting there occurs a circular reorganization of both the stimulus and the response, so that at the end of the process the actual reaction is made to a stimulus different from the one with which the process started. The total response is made up from many successive moments of responding; and in each of them the actual response is made to the stimulus changed by the first response plus the first response itself. Thus a book-on-the-table may become a book-to-be-reached, then a book-which-may-contain-the-fact-which-the-person-is-interested-in, and finally a book-to-be-read. The object "book" is externally and separately considered in the main as the same throughout the whole act, yet there is a different individual shade to each successive stimulus of which the book is a bearer, which consequently then requires a different response.

This change in the book as a stimulus is due to the change of the book as an end. Each new response to the book has effects that contribute towards a dynamic formation of the book as an end. From a mere interesting object to handle it becomes a definite source of interesting information. The book figures consecutively as a succession of ends, each differing from the preceding, each contributing to the changing course of action, though

[1] Chapter III, pp. 90-4.

itself conforming to the continuity and demands of that course of action. A single partial act, which at one moment is an end, becomes a means to the succeeding one.

The reorganization of responses on the spot within the newly developing situation is something that has been pointed out as a characteristic of purposive behaviour by many opponents of the mechanistically atomistic psychologies developed by S-R psychologies and by behaviourism.

The importance of such reorganization, as well as the shortcomings of the rigid stimulus-reaction theory have been justly stressed by many leading thinkers in the field of psychology. It has been pointed out that no reorganization of reaction is solely determined beforehand by the inborn connections of the nervous system, but that it develops in the process of reacting to the initial stimulus occurring in the course of activity already in process in a certain direction.[1]

But unfortunately in this connection, the short range and consciously purposive acts have served as a basis of analysis, and consequently the role of conscious foresight of the purpose is often over-emphasized. Thus Bode, in explaining how it happens that the appropriate reaction takes place, says:

> "It is necessary to provide some sort of control which will determine the order or the combination in which the reactions of the organism are to be set free. The appropriateness of the present act is determined by reference to a future act or future state of affairs, i.e. appropriateness is dependent on foresight and purpose."[2]

Also:

> "Purposive behaviour requires the sort of continuity that gives to the successive acts the status of means to an end. Consequently, the final act must somehow be foreshadowed in the beginning. The whole series must be a progressive co-ordination of activities and not just a sequence."[3]

[1] Bode, B. H., *Conflicting Psychologies of Learning*, pp. 246-7.
[2] Ibid., p. 179.
[3] Ibid., p. 249.

While it is true that in many cases of purposive behaviour such foreshadowing of the final act is definitely determining the appropriate organization of the intermediate acts, it is also true that the final act, especially in longer series of purposive activity, is by no means foreshadowed at the start of the total act. The direction of behaviour is often determined by the organization of preceding acts, while the underlying purpose is not only undergoing a radical change but often is directly evolved by the sequence of behaviour acts, which in their totality have a purposeful character. The final form of the termination of the act has often undergone so many changes in the intermediate activity that it is linked to the act that started it, and to the end involved in that starting act, only by the continuity of the behaviour and not by any identity of content or purpose.

There are numerous sequences of behaviour acts in which one act leads to another as means to an end, in which there can be no question of a conscious foresight of the final act existing at the starting point. The final outcome can often be recognized as an end-in-view only retrospectively, and may not have figured as such at the outset of the act at all, or may have remained unconscious during the whole act. The developing situation itself, when intelligently interpreted, gives suggestions to the succeeding responses, and the structure of those responses in keeping with the changing situation creates a purpose as it goes on. One can think of foreshadowing only in the sense that the structure of the first act or response determines to a certain degree the type of successive acts or the range of successive acts, if the continuity is to remain unified and meaningful, or, in other words, appropriate. But to call this foresight involves a very loose interpretation of that term.

Moreover, the term "purpose" or "end," as it is ordinarily understood, usually means something definite. Yet the analysis of objects commonly referred to as ends or purposes reveals widely differing ranges of definiteness. Sometimes an end-in-view means something very definite,

some very concrete object or act, like eating an apple, memorizing a poem, or putting on a certain dress. Sometimes, however, by an end-in-view is meant a process, the specific outcome of which is unknown at the beginning of the process. Going on a hike, rearranging flowers, settling a problem, are examples of such indefinite ends-in-view. In the case of rearranging flowers, the end-in-view becomes reorganized at every moment of the ongoing process, new steps being taken in light of a critical appraisal of the state of affairs so far accomplished. The setting of one flower in a certain position determines the position of the next flower and so on, until a satisfactory arrangement is arrived at. The direction of behaviour in this case comes from the dynamic determination at every stage of the development of the process and not from foresight at the outset. Not only the stimuli and the responses to them are changing in the light of the whole process, but the end-in-view undergoes the same sort of reconstruction and acquires a definite content only after the act is completed.

The emergent character of ends in purposive behaviour has often not been clearly enough recognized. Even psychologists whose general standpoint reveals a more intimate understanding of the integrative and dynamic aspect of human behaviour, show an intellectualistic dualism when discussing goal activities. Thus Wheeler, accepting a position similar to that held by Gestalt psychology, namely, stressing the predominance of functional relations and unities as against segregated and static existencies and substances, makes the following statement relative to goal activities:

" As no physical action commences until there is set up a remote end, no act of behaviour in living organisms begins until a goal is established'"[1]; which means that the goal is established in some way before the action itself and that it is recognizable apart from the act itself. This is clearly a dualism comprising an end-in-view and an activity of reaching for that end-in-view, a dualism which,

[1] Op. cit., p. 82.

though apparent in some cases, is not a suitable explanation for the greater part of purposive behaviour.

Goal reaching activities very often, perhaps in most cases, are started without any definite goal in view, and create that goal in their very process. Purpose or goal is thus usually not a distinctly fixed end; it is rather to be understood as a moment in the process itself; it is constantly made and reconstructed rather than just reached for. As E. Holt has observed:

> "It is not true that we do something in order to attain a dead and static 'end.' We do something as a necessary but subordinate moment in the doing of something more comprehensive. The true comparison is not between the deed or means and thought or end, but between part deed and whole deed."[1]

The idea of a dualism between goal and goal-reaching activity is misleading because it points out as a main issue something that can be adequately understood only when considered as a moment in a process. Purpose, or goal, or end, does not spring out fully equipped for the leadership of the activity; it is itself a child, a product of such activity—it *is* really that activity. To speak of end-in-view as directing the activity is nothing but a convenient expression. It happens very rarely that an end-in-view is really definitely fixed in all its content before the activity of which that end-in-view is an outcome, is completed. One cannot deny that some form of goal is directing purposive activity, but the goal does so not as something fixed prior to the act, but as something progressively changing within that activity. Experience is a power house, where both ends and purposes and the acts for reaching these, are created and recreated at every moment.

It must be observed in this connection that the immediate stimulus as a directive element in a purposive act does not have the importance assigned to it in prevailing psychological theories. The more extensive

[1] *Freudian Wish*, pp. 93-4.

and complicated the purposive act becomes, the further away the direct stimulus recedes. In a process corresponding to the reorganization of ends and means the direct stimuli themselves suffer a change and re-modification according to the meaning and needs of the developing situation. The total stimulating situation of a purposive act includes many stimuli that were not present at the beginning of the act, either because they did not exist at all, or because they did not exist for the perceiver. A purposive act sets things into new relationships, and out of these new meanings arise, which in their turn either change the present stimuli or themselves become productive of stimulating effects. An apple becomes an apple in a certain position, involving certain difficulties to get. A ball becomes a ball moving in a certain direction at a certain speed during the process of the game. As the stimuli become qualified due to the course the action is taking, they become different stimuli, from a dynamic standpoint, because they require different responses. The direct stimulus gains in content that is added by the changing situation as well as by the preceding responses.

In purposive behaviour the direct stimulus is subordinated to the structure of the whole process, which includes the activity of the organism or the individual participating, its inner states as well as the environmental factors in their changing interdependence. The responses are made in relation to those different and varying factors and not to the direct stimulus alone and independently.

Stimuli become stimuli because of the organization of the total behaviour; they are selected by the course of activity. An apple on a tree probably does not become a stimulus for a boy if he is not hungry, or when he is engaged in catching birds. The fence as a means towards reaching the apple does not become a stimulus if the boy is an expert stone thrower and can get the apple in this way. Stimulus is neither the starting point of the purposive behaviour, nor does it direct its course. It is itself selected and directed by the course. One can say that in general the presence of external objects is the

condition for purposive behaviour, as such behaviour involves the reference towards something outside of itself, and as far as behaviour in general is a function of a relation between an organism and its environment. But this is different from asserting that any particular single stimulus is the condition of purposive behaviour. Stimulus-reaction patterns are secondary elements. They acquire importance and determining power because, and in so far as, they become subordinated elements of that behaviour and cannot figure as such when considered independently of it. Purposive behaviour is not a passive mechanical system of responses to the stimuli in the sequence that they enter a situation, neither is it a haphazard reaction to any available stimuli. Environment offers us countless stimulations at any moment, and but a few are selected for responses. Such a selection is not determined by the qualities or the stimulating strength of the stimuli themselves, but by the needs of a course of action, which is working for its own appropriate termination and selects stimuli in its own interest. For the understanding of the selection it is not necessary to postulate conscious foresight and choice. Purposive behaviour can be selective without consciousness figuring as the selecting agent. Conscious foresight is undoubtedly present in a great many purposive acts, but the possibility of purposiveness does not depend on them. Often an unconscious adaptation to the needs of a developing situation directs the course of responses or leads the attention to certain stimuli.

Which stimuli are responded to, and in what sequence, and in which way is determined by the situation in *toto*, and this situation includes such factors as the availability of stimuli, the intent of the agent itself, the nature of preceding acts and their outcomes. The process is all in a state of change and interaction, in a form of circular response. Single elements of the environment have to enter in some relationship with the ongoing activity in order to be perceived at all, in order to become stimuli at all.

This capacity for progressive reorganization of itself, and for incorporating more and more extensively the elements of environment, as present in any given situation, and also as drawn from past experience, is one of the peculiar characteristics of purposive behaviour.

In all goal activities there is an incorporation of the results of past experience in dealing with the present situation, and a liberation of potentialities by a new reorganization of responses and stimuli in a new situation. These processes are especially evident in goal activities rich enough in their effects on behaviour to be called learning. Some learning is always resulting from goal activities. The extent and quality of it depends on the sensitivity and flexibility of the organism included. It is manifested in the behaviour of goldfish learning to take food from a plate of a certain degree of brightness only,[1] as well as in a child's behaviour in learning how to act honestly. In both cases some sort of goal activity helps to bring about new responses to a new situation and some modified behaviour is resulting therefrom. The reason why a goldfish's learning is not quite as evidently a learning as that of the child is not that there is difference in the process but in its complexity and in the value of the learning product of the process. In both of these cases we find in the new emerging behaviour some elements formed and drawn from past experience. But in both of them there is also an element of novelty in the resulting behaviour, a novelty which is a more appropriate response in the given situation than the preceding one. The old as well as new patterns are woven into a continuous and unified stream of activity.

The only certain difference in the structure of these two processes is that one can be sure that the goldfish is not conscious of its goal nor of the means by which it is reaching for that goal, whereas the child may or may not be aware of his purpose. Consciousness of purpose is not a necessary factor in purposive behaviour, though it is an

[1] Experiment by Wheeler and Perkins, cited by Wheeler, op. cit.,

important element in purposive behaviour on its highest levels. A discrimination between purposive behaviour devoid of consciousness of purpose and that possessed of such consciousness is sometimes indicated by the use of the terms "purposive" and "purposeful" respectively. Unconscious and organic processes themselves must be subject to some sort of purposiveness in their organization, or the possibility of conscious purposive acts could also be questioned, because in a purposive act not only the consciously controlled responses, but also the unconscious ones seem to be subject to reorganization in the face of new situations. This seems to indicate that the unconscious organic responses have characteristics similar to those on a conscious plane, namely, that they are capable of being appropriately subordinated to the total course of activity.

If our habits, innate tendencies, reflexes were really rigidly fixed, if our subcortical processes were self-sustained units regulating themselves independently of the higher processes or independently of the activity of the organism as a whole, our voluntary purposive acts would be able to manifest themselves only in a very limited way. It is because our organic activities are regulated by the organism as a system of activity, of which the conscious and voluntary acts are parts, and because all partial activities are subordinated to such a system, though not consciously controllable, that humans are able to act as integrated and unified wholes.

A goal activity is always to some degree creative, because the situation in the goal activity is of necessity always a novel one, even if the external conditions are similar to those dealt with in past experience. Though the partial elements of the situation may be familiar from past experience and even though responses to them have been exercised before, goal activity puts them in a new setting and organizes them in a different way.

The presence of familiar elements from past experience does not necessarily mean, as often argued, that the situation itself is identical with a past one. Thus, in the

ape-fruit situation both the fruit and the stick may be familiar, but the situation, in which the fruit figures as a goal not attainable by habitual means, and a stick as a tool for reaching that goal, is actually a new situation and requires a new set of responses. This newness as a constant element in the goal activities renders it impossible to explain them on the basis of response bonds formed and fixed by past experience. Even the simplest purposive act is creative to the degree that it cannot utilize habitual ways of responding and to the degree that a new goal emerges in the course of the purposive act.

The role that creativity plays in a purposive act ranges very widely, from a mere adaptive reorganization to acts that could be rightly called creative. In the case of animal behaviour and of human responses towards the physical and organic environment, the creative aspects are less apparent and often require sharp analysis to establish them. But this aspect gains in prominence as the complexity of purposive behaviour increases. The situations then become more unique, because the number of partial elements and factors included will also provide more varied combinations. And the more sensitive the acting agent, the more refined and varied the responses he is capable of.

But as soon as we reach the realm where ideas and thought participate, it is almost absurd to think of a response as a mechanical one. The very integration of some concepts into live experience requires a high degree of inventiveness and creativity. It would be impossible to think of a child who in a group project is helping his partners in work, as responding in a predetermined and mechanical way to the idea of co-operation. That idea is not there before the act itself. It is created in the co-operative work itself. The goal of co-operation is worked out through participation in a co-operative work, and worked out for every individual in a different way. The child is entering new relations, unknown to him before. In those new relationships the opportunity of new experience is opened, through which new concepts, new

ways of behaviour and also new goals for that same behaviour are created.

The appearance of the new goals in turn changes the environment of the child. A group of children who before the experience with co-operative work were but "other children," now become members of a group linked by a common task, become helpmates, source of a certain type of enjoyment in fellowship. An element of the environment (i.e. other children) through a creative goal activity has completely changed its face and therefore brings forth totally different responses.

Environment, as was brought out in a preceding discussion, in Chapter II, is not an aggregate of stable and fixed objects, things and stimuli, but is a meaningful unity of changing events, ideas, and relations which take on a different aspect with the ongoing of the process of experience and to which constantly something new is added. Goal activities are the main factors for such a reconstruction of environment. Through changing goals and correspondingly changing situations the environment is re-created at every moment.

III

While purposive behaviour cannot be discriminated from other types of behaviour on the basis of the type of aim it pursues, the different types or levels within purposive behaviour can be discriminated on the basis of goals included, means utilized and organic resources activated and participating.

The lowest type of goal activity is behaviour in which neither the goal nor the means used can said to be consciously perceived, and in which no means are used outside of the organic responses. The correlation of responses and the regulation of the movements of the organism are achieved not by conscious control of the situation, but by the integration of responses themselves while active in the situation.

Even the lowest organisms appear capable of purposive behaviour of this type. Thus an experiment with a paramecium[1] shows that this organism is capable of an appropriate reorganization of its responses when placed in an unusual situation. A hungry paramecium was placed in a tube at either end of which an obstacle was introduced. The usual behaviour of paramecia in encountering obstacles is to back a little and then to turn at a slight angle to avoid the obstacle. As there was insufficient room to turn around in a tube, the paramecium after several attempts at turning, reversed its cilia and swam to the other end of the tube. This reversal of cilia is a new behaviour act for a paramecium. Several trials and errors were made before this latter course of action was adopted. It proved adequate for reaching the goal, namely relieving the tension resulting from the organic need of food and the urge for swimming in order to attain food, yet the trial and error movements, and the elimination of unsuccessful movements, were regulated in respect to the goal. The paramecium was acting in a situation in which the combination of internal drives and of the external conditions was an unusual one and formed a stimulating situation, which could not be met by the habitual responses. A new set was formed in reference to both the internal drive and the external conditions. The initial goal was there in the form of an organic drive towards the release of the tension caused by hunger, and the environmental stimulus acquired a certain meaning in reference to that initial goal. An obstacle became an obstruction because the paramecium was hungry and already active in search of food. Its behaviour already followed a certain direction and the change in the motion of cilia was introduced for the sake of following that direction of behaviour. The responses are not chaotic; they are co-ordinated and selected with a certain amount of appropriateness with reference to the actual situation.

[1] Made by Day and Bentley, reported in Wheeler, *Science of Psychology*, p. 120.

Though we cannot presume that the paramecium was consciously aware of its goal, or that the reversal of cilia was seen as a means towards reaching the goal, a co-ordination of behaviour in reference to some state of the organism (tension, hunger) and in reference to some fact of the environment (obstacle) is surely present. Neither the drive towards swimming, nor the response in the form of turning around in the case of an obstacle would have any sense without the reference to the goal and to that element of environment towards which the course of action is directed or by which it is obstructed. Even if the goal is not consciously perceived, it renders direction to the organization of movements ; it also selects the stimuli to be reacted to. Although on an organic level only, there is a certain checking of wrong movements and a furthering of the right ones which cannot be explained by merely calling it a trial and error process. The hypothesis of trial and error and of the satisfiers and annoyers does not show why the wrong movements should be less satisfactory than the right ones, unless it makes use of the concept of goal activity and of directed behaviour in connection with such activity. There is no reason to think why reversal of cilia *eo ipso* should be more satisfying than stopping at the obstacle, unless both those responses are viewed in their relation to the total course of the behaviour. The reference to a satisfying and annoying course of action as a reorganizing factor has no significance unless viewed in reference to the preceding and following courses of action.

The behaviour of the paramecium would differ from human behaviour in that the paramecium was able to utilize only its own organic activity for maintaining the necessary course of action. It was not able to introduce changes in the environment (such as removal of the obstacle) as a human being, or even a higher animal, might be able to do. Yet the reversal of cilia, which act is not in the habitual range of a paramecium's conduct, is as much an invention from the standpoint of its behaviour and capacities, as the invention of an aeroplane

to soar over mountains and seas is from the human standpoint. The difference is not in the general characteristics of behaviour, nor in the principal structure of behaviour, but in the type of means used, in the amount of sensitivity, and in the number of tools within the range of an animal. In both cases the situation is solved by the integration of activity and the needs of the situation; in both cases the response is an invention, is utilization of conditions, of means, of elements of the environment, a synthesis of possibilities. In both cases the behaviour is creative. The difference is only in degree.

On the other hand, human behaviour is not lacking in the sort of organic reorganizations described above. A careful analysis of human purposive behaviour will surely reveal a host of such unconscious and organic reorganization of reflexes. But unfortunately this region has not been explored enough, and these behaviour acts are therefore relegated to the category of mechanical responses and inborn reflexes, and their bearing on the phases of behaviour that are consciously purposive are thus not evident.

The next more developed step of purposive behaviour is found on the level where the organism is capable of more definite sense perception, where the immediate objects of environment have a certain immediate meaning. The apes in Köhler's experiments[1] recognize food without being in immediate touch with it, as lower organisms would have to be in order to be able to respond. The animals are capable of distant perception; this widens the range of elements they are capable of integrating in their pursuit of goals. The food is recognized as a goal. But there is also a slight recognition of certain means. The only limitation is that, not being capable of imaginative or conceptual thinking, both the goal and the means to it have to be in the same perceptual field before the animal is able to make use of the means, before the animal can see them as means to the goal.

[1] *The Mentality of Apes.*

Besides being perceptually aware of the goal and means, the higher animals are capable of getting some sort of meaning of consequences of certain objects or acts. Although it is highly improbable that even the highest animals are capable of anything like conceptual anticipations, a kind of rudimentary sensing of the consequences seems to be present in their perceptual awareness, as has been shown by these experiments made by Köhler with apes. The stick must suggest something to be pushed with, the string something that means pulling. And these tools are definitely recognized as means for reaching the goal. These immediate meanings of stick or of rope or of other tools include a reference to some very immediate consequences. Köhler's apes are not only able to connect the spatially distant, as for instance the stick placed in the cage with the food outside of the cage, but they are also able to integrate the immediately given with the very next following, which is illustrated by the experiments where the animal had to search for a tool not immediately present.

Aside from the difference in the refinement of organic structure as compared to that of the paramecium and the degree of variety and of richness in the environment responded to, the structure of the goal activity remains the same. By the integration of internal drives with the stimulation offered by the situation, a re-modification of responses follows until the activity is brought to a satisfactory termination, that is, until the goal is reached. In what form the termination of activity will become satisfactory is in no way known beforehand. The specific nature of the solution will depend on the specific combinations of responses and sequences of acts made in the course of attainment of the goal, and co-ordinated by the results in any single moment in reference to the course of the total situation.

The end, satisfaction of hunger, as well as the external stimulus, food outside of the cage, undergo a continuous reorganization, while different objects are seen as tools for reaching for the end. Unattainable food outside is a

different stimulus from the "food-outside-to-be-reached-with-a-stick," and each of those stimuli calls for a different action. On the other hand, the act of noticing a stick and relating it as a tool with the food, is the reason for changing the characteristics of food as stimulus.

On the highest level of mental development and organic complexity, end-in-view can be consciously perceived, or conceptually projected into the future. Purposes can be in the form of emotional satisfactions, like pleasurable supper or nice music, they can be in the form of objects to be possessed, such as new clothing, they can be in the form of some mental achievement, such as the reciting of a poem or the writing of an article. The general characteristic of all types of purposive behaviour on this level irrespective of the specific characteristics of any individual goal is that conceptual thinking is used as a tool for both the conception of goals and the selection of means. Intent, critical comparison, a foresight of consequences, and an ability to judge and choose, make purposive behaviour of man much more appropriate and intelligent. A great variety of tools, material as well as mental, is at man's disposal in his goal activities, and he is able to control the external circumstance much more effectively than the organism lacking intelligent mentality. Man's tools are not limited to the reorganization of his own responses and organic as well as mental resources, or to the visually present. His tools include not only spatially and temporally distant elements, but also existentially different types of elements. The relation between means and ends becomes a very complicated one and often very subtle. Not only physical objects are used as tools, but also abstract thinking, concepts, ideas, influences of other people, organization of one's thinking. Man not only can set a purpose such as a higher standard of living, which is a conceptual purpose, but also can utilize means towards it, which are also the results of such conceptual thinking. The integration done by purposive behaviour on lower levels is a limited one because of the limitation of the organism in potentialities, sensitivities, and possible

activities. On this higher plane the amount of co-ordination and organization done in the pursuit of purpose is tremendous.

Because of the means of communication, the environment from which the purposive action of a human being can draw is very wide. A human being is not limited to the directly available for actualization of his goals. He can utilize other people's experiences and ideas, he can use the distant past, he can count on the future.

Animal behaviour is selective, but need not be intentionally so. It is selective because of the structure of the process. Means are chosen according to the immediate demands of the situation. The goal, really the goal-activity, has direct domination over the means. Conscious purposive behaviour is not thus limited. The means and tools are as much subject to conscious foresight as the goals themselves. Whereas on the lower level only an immediate anticipation of the consequences is possible, in conscious purposive behaviour both the goals and means can be projected temporarily and logically quite far. The foresight even of the most remote consequences enters at the first stage of the development of the action and determines its very first step. In the utilization of tools and in the constructiveness of purposes man is inventive on a much wider scale than are animals.

IV

Several methodological observations based on the preceding analysis may be made in reference to the study of the conscious purposive behaviour of man.

First, acts which even viewed as whole might be classed as belonging to those directed by conscious purpose and intelligent organization are not so directed in all their aspects. There are degrees of intelligence, appropriateness, and conscious re-direction in all purposive behaviour and the role deliberation plays in purposive behaviour on a higher plane is a very varied one. One must not forget that any behaviour act presents an integration of all

organic and mental functions, and as such shows intelligence and " purposiveness " in different degrees.

There are, for instance, behaviour acts which, though started with what could be called a conscious and intelligent purpose, are directed and carried out by the mechanism of the developing process itself, and therefore give an appearance of either a complete automatization or of the organization of the type seen in the case of lower animals. The reflexes co-ordinate themselves to the situation with a moderate degree of newness almost without any aid from conscious intelligent direction. Thus, an office worker returning home is following the course automatically, without much conscious awareness of his goal, in spite of the fact that in the course of that activity he has to make numerous re-adaptations, which cannot be met with the fixed mechanism of automatic responses. The course of behaviour, once started, regulates itself so long as something very radically obstructive does not block it. This seems to be always the case when activity that is familiar is allowed to run more or less its own course, either because of lack of energy, or because attention is diverted elsewhere.

Secondly, there are many cases of purposive behaviour where, though there is a possibility of some degree of conscious and intelligent thought, the actual behaviour resembles somewhat the purposive behaviour of the higher animals. This is true when the activity follows some urge, not clearly and consciously in mind. Very often the goal and the means for its realization do not enter any relationship before they can be perceptually seen as such. The different elements of the situation have to be spatially, temporally, and psychologically very near to each other before they can be seen in a goal-means relationship. This is especially frequent in cases where the conceptual thinking of the actual agent is either temporarily or more permanently not very acute. The latter state would be especially true in the activity of young children. Jean Piaget's experiments with children have shown that under seven years of age they are incapable of seeing the

functional relationships between events and objects, unless such relations are almost visually perceptible.[1] As the end-means relationships fall into the class of functional relationships, it is probable that the insight of very young children into the mechanism of their own purposive acts is not much above that of the higher animals.

And finally, when conscious and intelligent direction is unhampered either by lack of mental energy or by lack of ability in conceptual thinking, purposive behaviour may lack in conscious foresight and direction because of the complexity of the situation, or because the development of a purposive activity has not yet arrived at the stage where its major evolving objective or purpose has reached a level of articulation, a stage where it can be clearly enough seen.

In the first case, the multiplicity of partial ends and other factors hampers insight into the ends or goals involved, to which inability the lack of distinction between the partial ends and means and the major ones contributes to a very large degree. In the other case, because of the evolving nature of the ends and of the situations in which the purposive behaviour takes place, the end simply is not there before the process is at least partially accomplished.

Thus a student of social relations may be planning a programme of better social understanding, though he does not know beforehand either the exact mode of such understanding, nor the exact means to achieve it. An artist goes about creating something without having a definite idea as to the exact outcome. Nobody will deny that both cases belong to the purposive acts of the very highest degree. Yet the purposiveness in both cases is rendered by the continuity of the outgrowth of the activity from the preceding activity, and one realizes what one is actually about only retrospectively. It is not ends that grow out of the preceding ends in this case, but activity that grows out of the preceding activity and evolves ends in the process. Ends are but moments in such a process, and often submerged moments and conscious judgment

[1] *Judgment and Reasoning in the Child.*

concerns itself with the judgment of accomplished ones more than with the evolving ones. One act is producing another, a more comprehensive one, and this one leads to the following one in a succession in which appropriateness is clearly present, without any projection of a definite future, end or outcome.

In the case of most purposes or ends or aims of a complex nature, these are seen only when by peculiar, and often almost accidental combinations of circumstances, one is well on the road towards that end already. Democracy did not become a conscious aim before some forms of democracy were quite unintentionally in practice already. Social organization and group thinking did not become aims until industrial civilization and large scale production, themselves the results of quite different aims, had actualized co-operative thinking and planning in new forms.

Ends and aims, as they are in actual life, seldom present themselves as simple and easily comprehensible units. They are usually functioning as an organization of different ends and purposes, the relation of which to each other, and the contribution of which to the major end, if there is any such clearly recognized, are not often seen, but which nevertheless take an active part in formulating that major end.

On the other hand, a large number of organic and mental functions take part in any single purposive act, the major purpose of which is consciously perceptible. An act of learning a piece of poetry includes other functions besides the mental concentration on the content of that poem. A host of sensory-motor, emotional, and even purely organic functions participate in such an act. These two types of functions, though of different characteristics when considered in separation, are organically unified by participation in the same act. Therefore their mechanism must be somewhat similar to each other. If the one set of functions is dynamically and functionally reorganizable, the other must also share the same characteristic to a certain degree in order to be an integral part of the total

unit of activity. If the purposive act affects the reorganization of the conscious responses, it affects in a similar way the functions that are not consciously controlled. And if the conscious responses and acts have an influence in formulating the purpose, the unconscious ones also share in it as integral parts of the course of activity evolving the purpose. Consequently, learning a piece of poetry organizes not only attention, memory and thought processes, but also the emotional reactions and sensory-motor responses, because these enter as integral parts of the total act of learning. On the other hand, the pre-existing responses and reflexes of the type mentioned determine the total outcome of the process of learning.

So it follows that a purposive act must be regarded primarily as an outgrowth of previous activity and not as an independent unit starting and activated because of some end or purpose clamouring for actualization. Purpose or end enters only secondarily, whether in the form of a definite end or as an objective purpose evolved by the process of behaviour. The preceding experience enters not only as a helpful agent in the form of completed integrations and modified responses, but as a source from which the continuity of the following activity draws. The activity of a boy who is going fishing is directed by certain environmental elements important in the case of fishing, by his own wishes and desires regarding those elements of the environment, and by his past experience. The act of fishing, on the other hand, cannot be isolated from the preceding course of activity because in the previous acts lie the roots of this new course, the motives and desires which led to the fishing. The formula of purposive behaviour is not " from purpose to deed " but " from one deed to another," the purposes evolving between and within those deeds. As Holt has put it, " we do something as the necessary but subordinated moment in doing something more comprehensive."[1] Purposes are not pre-existing but eventual, and the reason why purposes have been considered as the starting point of activity is

[1] *Freudian Wish*, p. 93.

that we have carved a section out of the total course of behaviour at a wrong place.

Thirdly, we can see that purposes and ends are neither definitely fixed nor static. Thus, an end to succeed, or an end to gain information in history, are types of ends the exact content of which is not known beforehand. These ends furnish but the starting direction and become concrete and real ends only after they have been accomplished. Yet the action of achieving those "ends," the specific acts towards them, is not determined by these original formulations; it is determined by that concrete content that emerges from the activity at every step of its development, by those integrations that follow when the individual sets himself or is set in relation to certain materials or facts. These materials or facts, in turn, though selected by the direction which that individual's behaviour has taken, also bring change to the specific responses; and these in their turn contribute to the re-formulation—really to the actual construction—of the true end or purpose in its concrete content. And inquiry into the behaviour preceding those end activities will show the slow evolution of those ends from some other activities.

While such end-reaching activity proceeds, new responses are made, new integrations of the individual's powers with elements of the environment are accomplished, new insight is gained. Whatever tendencies and capacities the individual has carried over from past experience are reorganized and combined in a multiplicity of ways. As a result of all this, the individual is capable of more comprehensive activity. Thus energy is saved by a unifying of functions. Separate parts taken as a unit are reinforced and complement each other.

Purposes are not pre-existing but eventual. This explains the disparity between the intended or thought purposes and the actual ones, revealed by careful analysis behind or within the activity itself. This happens in individual as well as in social behaviour, but more frequently in the latter, because it is more complex.

Miss M. P. Follett[1] reports that while studying the purpose of certain organizations (labour, co-operative) she was struck by the fact that usually those organizations were not actually serving their alleged purposes. While there is often a mis-statement of actual purposes, this is not necessarily a case of intentional deceit. It is an instance of where a purpose, evolving in the process, is not clearly recognized and is therefore called by the false name. As there are different degrees of complexity of purposes, from those that are very definite and minute to the complex combinations of many separate purposes, this situation is not surprising. Likewise it is also not surprising that one has to go a long way in analysing complexes of activities in order to find the true objective purpose.

[1] *Creative Experience*, p. 32.

CHAPTER V

PURPOSIVE BEHAVIOUR AND LEARNING

I

AN analysis of purposive behaviour as a reorganizing factor in human conduct holds many fertile implications for the psychology of learning. In the brief study of purposive behaviour made in the preceding chapter it was shown that the prevailing notions of fixity of certain fundamental reaction patterns as well as the dualistic segregation of the acting organism from its environment or stimulating situation are due to a misconception of the nature of behaviour. We have seen, in fact, that purposive behaviour exhibits flexibility of behaviour, and that it is a function integrating the initial activity of the acting agent with the stimulating situation. The source of selectiveness, of direction, and of goals in human behaviour is to be found neither in the acting agent alone nor in the stimulating situation apart from the continuity of the process of behaviour. It resides in the structure of the behaviour itself, which latter integrates both constituent factors and reorganizes the stimulating situation, creating a novel one.

It is in this integration and circular reorganization of reactions and new situations that learning occurs. Consequently, an analysis of learning from such a standpoint should prove fruitful.

From the standpoint of methodology in educational thought, the psychology of learning holds a very strategic position. The views held regarding the nature of learning are on the one hand intimately connected with the basic philosophic outlook regarding human experience ; while on the other hand, educational practice, both in and outside the school, is directly determined by conceptions

of learning. The psychology of learning, consequently, cannot be regarded as a mere "specific study." It derives its specific formulation from the meaning given to concepts like mind, consciousness, the role of sense perception, the inter-relation of the organism with its environment, and the like. And the content of the curriculum, the methods of teaching and the specific ways of conducting the educative process, are all directed by the views held on the nature of learning.

While the psychology of learning has undergone revolutionary changes in recent educational movements, it is still to a very great extent under the influence of ideas derived from outworn positions, and bases evaluations on views of learning no longer accepted or acceptable.

The result is that we find educational practices of today frequently showing a confusion of conflicting trends, often in the same system, and the so-called progressive and dynamic tendencies employing concepts and practices inconsistent with their basic beliefs.

Learning has ceased to be regarded as a simple process of assimilation of materials and memorization, and has come to be viewed as a process affecting the human organism in the totality of its activity and experience. Its understanding, therefore, has carried educational thought into problems too intricate to have been dealt with consistently as yet by modern educational philosophy and conflicting views on learning are held simultaneously, though this is not often directly apparent.

One of the traditional notions of learning still persisting in modern educational thought is that propounded by faculty psychology, namely, that all learning is training of the mind and developing the powers of its faculties, such as reasoning, memory, perception, imagination and the like. While faculty psychology is hardly accepted today, the evaluation of curriculum materials and the procedures of teaching developed by it are yet practised. As a contemporary educational writer has said, the notion that pupils have minds which need to be trained is hard to dispel and still dominates the school-room.

A careful scrutiny of the curriculum materials will show that numerous subjects are taught and numerous methodical devices are used for no better reason than a supposed value they possess in training the mind. Certain practices are so deeply ingrained that their usage is taken for granted and their underlying assumptions are not looked into. And the tenacity of our schools in catering to the so-called higher faculties, under-emphasizing other aspects of personality, clearly shows that the effects of the faculty theory of learning are still active.

The Herbartian apperception theory, which views learning as a development of ideas through the assimilation of information, is still more predominant. Mastery of information and knowledge is an educational standard, in terms of which many evaluations are effected. The intellectualistic dualism implied by such views on learning is present very strongly in the most progressive educational practices, as is clearly seen in the dispute over the psychological and logical organization of learning materials, and in the preference for intellectual subjects over the so-called vocational ones in so far as their educative value is concerned. Learning still too often means intellectual learning only, and as such is regarded as different from the changes brought about in man's behaviour by his ordinary experience. Intellectual studies stand in the foreground, and the social, emotional, and other learnings are treated as extra-curricular ones, and are consequently less subject to conscious planning.

It is true that much of our learning materials is being revaluated from the standpoint of their worth to actual behaviour and life. But it is also true that the materials of instruction play a far greater role in educational procedures of today—even in those of the most progressive and dynamic type—than their actual educative value would warrant. A great deal of that emphasis is due to the passive acceptance of the evaluations taken over from the times when a different psychology of learning was governing educational thought. Education is still conducted in terms of information for the sake of

discipline, and knowledge for the sake of mental training. The apperception theory of learning persists in influencing those who deal with the conduct of learning.

Another group of misleading conceptions regarding learning sprang from theories based on the conviction that information and knowledge could be made inherently educative when graded and organized according to their complexity and according to the apperceptive basis of the learners. The logically simple in such theories also represented the psychologically simple, and thus, under the guise of psychological organization, a structure of abstract knowledge was made acceptable to practice, especially as a uniform and apparently efficient technique of teaching was thus made possible.

Around such an organization of learning materials there has been built a structure of educational valuations so ingrained that it influences even those educational practices that try to conduct the educational process through self-initiated activities and projects. The selection of such projects and the evaluation of the work done is in terms of school subjects or cultural fields which have been held traditionally to be important in education.

These conceptions of learning approach human experience from a dualistic point of view and subject the evaluation of the outcomes of learning to a statically prefixed standard. Learning, when understood either as training of the mind or the development of ideas through the assimilation of information and knowledge, presupposes that the mind is an entity, functioning independently of the rest of the behaviour of the organism. Human experience is thus artificially split up, its functions arbitrarily divided and segregated. The result is that anything ensuing from learning conducted in such terms is not integrated in the actual behaviour, and is therefore useless stock. The functions of the mind, when treated and cultivated in separation from the organic unity that is productive of them, namely, the total behaviour, naturally do not offer themselves to the service of this

behaviour. And materials assimilated outside of the demands of actual behaviour remain inert and unproductive of improvement in conduct.

Behaviour and learning, when regarded from an empirical standpoint, are productive of new meanings and new forms of behaviour, of new contents of experience, and are individually varied in their final outcomes. On the other hand, learning, conducted in terms of training the mind or assimilating information, is subjected to a prefixed standard, in the sense that the intellectual abilities as well as the materials for an educational development of personality are conceived to be the same for everybody, and in the sense that it is believed the results of learning can be determined beforehand. The standard for evaluating the outcomes is derived externally, either from an abstract idea of a well-trained mind, or from some notion as to what is a proper store of information. Thus the outcomes of which the process of learning is productive dynamically and individually cannot be evaluated at all, and therefore cannot be consciously achieved.

Another criticism that can be made against these conceptions of learning is that they tend to leave the learner out of the process of learning. The learner is but a passive recipient and assimilator of the detailed patterns fixed in advance by those conducting education. As such he does not enter as an active factor into the determination of the process and outcome of learning.

Learning, when analysed empirically, is a process in which three important elements are active—the learner, the learning materials, and the process of learning itself, each of which influence and contribute to the final outcome. In the two trends mentioned above, only one element of the three contributing towards the process as a whole has been emphasized, namely the materials of learning. The learner and the psychological process of learning itself are subordinated to the demands of the learning materials. The approach to learning is made not from the standpoint of the nature of the process itself, but from something external, that is, materials of learning

as subjects, facts, thought processes considered apart from, and not as parts of the total process of learning. As a consequence of such artificial splitting, learning grows to mean something that is abstract and distant from life and ordinary experience. And everything connected with learning (schools, education itself) becomes something alien to life, and therefore not a contributor to the betterment of human experience to the degree that it can and should.

Behaviourism has abolished the major dualisms found in most conceptions of learning, for to the behaviourist, human behaviour has come to mean all observable behaviour, and learning the modification and re-modification of that behaviour in all its aspects. The gradual change that has been observed in the notion of learning—that of considering learning an aspect of behaviour—has made it imperative to evaluate and to conduct educational procedures in terms of behaviour and not in terms of materials to be mastered or of an abstract mind to be trained. Habits, skills, emotional responses and tendencies of reaction have acquired their place in our educational vocabulary as terms denoting important learnings. The evaluation of some behaviour patterns has been included among the outcomes to be tested alongside the mastery of subject matter. The environment, as a source of stimulation, and therefore as a source of learning, has been given more of its due attention. Learning is now being understood as an activity that concerns all the modifiable expressions of an active organism. The intellectualistic dualism of our former theories has thus been broken.

Unfortunately, these desirable aspects of behaviourism are accompanied by numerous defects and shortcomings, the most important of which are the distressing atomism and mechanism of the behaviouristic theories.

Behaviourism is pre-eminently scientifically-minded. It has been interested in discovering the ultimate and reliable elements of human behaviour which would serve to erect a "scientific" structure patterned after the

model of the exact sciences, and which procedure would yield exact and immutable laws.[1] As a consequence, everything that spelled "consciousness" "mind," "intelligence," has been barred because of the association of these concepts with the speculative and unscientific methods of former investigations. The simplest, most mechanical, and discrete instances of learning have been chosen as the phenomena for experimentation, following the pattern of the analytical sciences, and because these instances of learning have yielded the most exact and apparently evident facts.

The behaviourist has developed his theories of learning somewhat as follows: Experiments with animal learning and with the simplest type of mechanical learning of man under strictly controlled conditions have yielded facts which he has used to prove that all man's behaviour can be explained mechanistically.[2] He sees it as the formation and strengthening of bonds between a discrete stimulus and an equally discrete response. These bonds are primarily those of nerve currents, physiological in their nature and unintelligent and inflexible in their character. They are the results of an interaction between the inherited original drives, few in number, and the stimuli offered by the environment. The sequences and variety of behaviour acts of the developed organism are the result of the grouping of those original responses by conditioning, through which the original response to a stimulus becomes connected with whatever that stimulus has been accompanied by or associated with in temporal sequence or in spatial co-existence.

Thus, in the behaviouristic representation the total process of learning is split up and presented as an aggregate of so many atomistically specific functions, of so many specific responses to specific stimuli, so many bonds and so many original tendencies. How all these specific and elementary processes function together so as to make meaningful behaviour has remained unexplained.

[1] Weiss, A. P., *A Theoretical Basis of Human Behaviour*, p. 7.
[2] Watson, J. B., *The Ways of Behaviourism*, p. 42.

To the behaviourist, the process of learning is primarily a fixation process. It takes the form of conditioning responses and habit formation, both mechanistically formed sequences of acts. Learning is supposed to occur mainly by repetition and drill, and the task of teaching, consequently, is to provide situations which offer a constancy of stimulation sufficient to form bonds and habits, and to provide for the adequate practise of those.

Behaviourism, in its effort to ban all " arbitrary hocus pocus whereby man's nature acts in an unpredictable spasm when he is confronted with a new situation,"[1] from its system of understanding human conduct, has also banned from it all unity, meaningfulness, and intelligence. The laws of learning formulated by behaviourists are the laws of mechanical repetition and drill, by which the patterns of conduct are moulded, and in which the active and determining participation of the organism is limited to the functioning of original drives and of vaguely determined satisfiers and annoyers.

While this theory has freed the process of learning from the domination of subject matter, it has subordinated it entirely to external stimulation. In either case of domination, the essence of learning, namely, the constructive building-up, is neglected and misunderstood. While behaviourism has advanced the view that learning is behaviour and a way of re-modifying that behaviour, and thus apparently approaches the human organism as an active and self-determining unit, in the last analysis this activity has become a passive yielding to the pressure of circumstances in the external environment.

II

The conception of learning held by most of the progressive educational thinkers of today is that of the reconstruction of behaviour through purposive behaviour. This conception is a composite product of what may be called organic psychology, which views human behaviour

[1] Thorndike, E. L., *Educational Psychology* (Briefer Course), p. 149.

as the fruit of the total integrated activity of an organism, and of empirical philosophy, which holds that experience is the sole and ultimate basis for understanding anything that concerns man and his man-made world.

This conception of learning, especially this approach to its understanding, is rich in possibilities. Thorough changes in educational practices would be the result if its implications were fully seen and followed out consistently. Its potentialities, however, have not been explored as yet, partly because our educational outlook is still dominated by atomism and intellectualistic dualism, partly because the recency of this approach has not allowed us to see its full meaning in the details of its applications. It is not unusual today to find educational theories or trends of practice that accept this latest view of learning, yet that use in discussing the details of learning itself, concepts and ideas which, if not diametrically contradictory to their main position, at least cannot be considered especially helpful and elucidating.

What are the implications of the view of learning as a reconstruction of experience through purposive behaviour?

The analysis of behaviour in the preceding chapters has given several important clues for an analysis of learning considered as a way of behaving and as a way of reconstructing that behaviour.

All behaviour, we have observed, is to be regarded as an inter-relational process between the acting agent or organism and its environment in whatever form this is present. Behaviour is a function of the organism as well as of the environment, both of which undergo certain changes as a result of that inter-relation. Behaviour, therefore, has to be regarded primarily as an evolving relation between the individual and his environment. This viewpoint reveals to us several fundamental aspects of learning.

In the first place, learning, as all behaviour, is an inter-relational process, the three important determining elements of which are: (1) what in this connection may be called the learning materials (that is, environment,

stimulation, teaching, books—in fact, everything with which the learner comes in contact and to which he reacts); (2) the nature, abilities, and interests of the agent of learning; and (3) the structure, form and sequences of the process of learning itself together with its results. All these three elements are contributive to the nature of the process of learning and its results, and their specific form and content serve as directives to further learning.

Secondly, the particular form of the process of learning is effecting changes in the agent as well as in the materials of learning. They are all interdependent of each other, and consequently, it is essential that any study of learning and any conduct of learning consider all these three factors of the learning situation as equally important, and treat them according to the role they play in determining the form and content of the total process of learning.

In other words, our first point requires that an effective scheme of education must take into account the interests, abilities, drives, and needs of the learner, and the previous experiential deposits with which he enters the new learning situation. Then on the objective side, it is important to know what compulsions, suggestions, meanings and inspirations, as well as necessary facts, the objective environmental situation may contain, and into what relation they enter with the factors offered by the learner. Finally, the analyst of learning must know what changes occur in both the subject and object during the process of learning, and how that process itself helps or hampers the development of new possibilities.

In most current theories of learning emphasis is laid only on any one of these elements or aspects of the learning process. Thus the traditional theory emphasized the materials of learning. Learning situations were constructed so as to suit the demands of the subject matter and assure as complete a mastery of them as possible. The principles of educational practices were not derived from the analysis of all of the elements of the learning process, but only from that of the learning

materials alone. The psychology of the learner, as well as the structure of the process of learning, were neglected. It was the nature and the demands of the subject matter to be mastered that governed the conduct of education. Subject matter was thought of as something objectively valuable and fixed, to which the learner as well as the process of learning was to be adapted. Thus, learning was conducted in terms of but one element of the total process. And as this element was regarded not as a part of a changing whole, but as an unchanging entity, the whole process acquired an aspect of uniformity and statics. Materials of learning, when considered apart from the actual learning situation and in separation from the individual needs and interests of the learner, appear to be uniform as to their educative value and stimulation. So are the learnings, when considered not as changes in the experience of the learner, as changes in meanings, concepts and ways of behaviour, but as an assimilation of a determined body of knowledge.

Today, the " child-centred schools " have swung to the opposite extreme. The interests, abilities and needs of the learner are taken as a basis for the formulation of the educative policies as well as for the selection of learning materials and situations of learning. Methods and practices have been evolved to suit the learner. Teaching is adapted to the peculiarities which the subjective structure of the mind of the learner seeks to impose on the process of learning, irrespective of the effect that the structure of the materials of learning (or the elements of the learning situation) may have on the process and on the results in any individual situation of learning. Child-centred schools, while emphasizing the purposes, interests, and initiative of children, tend to overlook the unique and individual results that a relation of those subjective psychological factors to the objective learning situation will produce, and the part that the structure of these materials will play in the total effect. The learning process and its determination is viewed from the one end of the relation only.

The needs and desires and inclinations of the learner cannot be treated in isolation. The learner is interested in something, desires something, possesses tendencies in some direction. There is always a contrasting pole to the so-called subjective aspect of behaviour. That contrasting pole may be in the form of objective structures, in the form of logically compelling ideas, concepts, relations, in the form of physically given objects, events, or situations, or in the form of other organisms, with their desires, actions, and reactions to the behaviour of the individual. That something, or a succession of somethings, has a structure of its own and affects the content, the quality, and the direction of the individual desires when set in relation to them.

This is important in the educational treatment of the individual. Both the subjective and objective end of any process of behaviour and learning are intimate and interdependent parts of the same process, and an adequate understanding of the one is impossible without simultaneous knowledge of the other.

The statement that recent educational psychology does not concern itself to any great extent with the object and the subject-object relationship may appear to be in contradiction with the statement already made to the effect that present-day psychology is over-emphasizing the direct stimulus as a factor in the psychology of learning. The laws of learning, for example, as formulated by Thorndike, and as used as a basis for developing practical methods of classroom processes, are direct formulations of stimulus-response relations. Reeder (*Simplifying Teaching*) expresses just such a relation between original tendencies and the stimulus,[1] between the inner and external. But the question arises whether the direct and single stimulus is the kind of " element and environment " with which the learner puts himself in relation in a process of learning. The answer has already been given here.

[1] In a recent book (*Elementary Principles of Education*), Thorndike and Gates are using the term " stimulation," which term is capable of including the interactive characteristics of the S-R relation.

As was discussed above, behaviour is a function involving objects that have meanings, external events that show continuities and unity. It is not a function of single, isolated stimuli. Stimuli are responded to as subordinated parts of larger wholes. Thus, the question of the inter-relation of the external and inner factors, of the subjective and objective aspects of learning, is not solved by an analysis of discrete and specific stimuli in their connection with the appropriate fixed responses; and the theory of purposive learning, which deals with learning in its meaningful sense, is still left with the problem of the inter-relation of inner factors of the learning process with the factors supplied by the objective experiential situation.

Laws of learning cannot be formulated on the basis of partial functions or on the basis of acts of learning that are not representative of all learning. True principles of learning can be evolved only from an analysis of the meaningful relation of the learner and the materials of learning in situations in which learning usually occurs. The characteristic of this relation is not an atomistic one-to-one connection between a single stimulus and a definite response.

A great many of the guiding concepts evolved around the theory of child-centred schools suffer from a one-sided emphasis. The term growth, for instance, rightly deserves the criticism that it has evoked, namely, that of being an empty term possessed of no criterion for the evaluation of its own process. It can be used as a criterion for the evaluation of learning only when the changes in interests, purposes, concepts, meanings, and ways of behaving are brought into a true relationship with the objective materials on which this change actualizes itself, and which form the contents of the outcomes of such a change.

Growth must be evaluated in relation to its direction or aim, and in relation to the objective contents of the experience that this onward direction of behaviour is either integrating in its structure or evolving by its

process. It also must be evaluated in relation to the effects on all other people concerned. The consideration of these factors will indicate whether the growth of individual experience is richer and wider as to its content, more capable of productive processes, more fully organized, and therefore rendering a more workable basis for the coming experience, and is more significant and valuable in its social effects.

The evaluation of growth, or even only the cognizance of the fact of growth, pre-supposes an analysis of the object side of the learning relation as well as of the changes in the subject pole of the relation. And the principle of "activity leading to further activity" has no value as an educational criterion unless it is shown that the further activity is in some way a contribution to the values either in the nature of better types of activity or in the utilization of a higher order of experiential materials.

Unless growth in activity is accompanied by a corresponding growth in the content and methods of organization, no good in the educational sense—no growth—will result therefrom.

Turning now to the second implication of this concept of learning, it will be recalled that in the discussion of behaviour it was pointed out that due to the interrelational activity between the organism and its environment both the environment and the organism as well as the inter-relation itself suffered change. Likewise the concept of active behaviour implies that while the organism makes a definite response to the stimulus, it also, by so doing, changes the stimulus, which, when seen on a wider scale, means that the environment of the behaving organism is being changed because of its behaving.

Consequently, learning as a re-modification of behaviour is a learning that occurs at both poles of the process. In fact, one might say that not only does the subject learn but the environment learns as well. Environment, which in this case would include what we call the materials of learning, is not a static entity confronting the learner.

It is partly a product of his own creation through previous learning. The learner is not confronted with materials of learning to which he is neutral. These materials are imbued with specific meanings and have specific forms acquired in previous experience. The learning that is to come will further affect them in the same direction. There are no purely objectively given objects, or facts, or ideas; these are conceived as they are responded to. The particular responses made in the course of the process of learning are to a certain degree creating these objects and ideas. Correspondingly, it is fallacious to expect that materials of learning are really uniform for all learners; every educand has a unique course of past experience, and to every one of them the materials must vary accordingly.

A growing interest on the part of a learner is not only more interest; it connotes interest in different things, or interest in supposedly the same thing in different ways. We can say that a result of a better executed project is not merely an increase of ability to execute better projects. The result includes a new viewpoint on the materials used for that project, new meanings, and new concepts, and therefore a set of new objects, of new concepts and a new environment. The student actually changes his concept of a farm after having worked on a farm project, and those changes are intimately connected with the type of mental and organic functions that were employed while working at that project—with attitudes and meanings developed during that process. What was learned or the way it was learned we discover by analysing both the facts and the materials used while working on the project, and the mental functions through which those materials were responded to in the dynamic inter-relationship.

The foregoing refers to environment as a unity of meaningful objects, events and relations. But even though we were to consider environment as an aggregate of isolated stimuli, we would still have to admit that something happens between the presentation of the stimuli and the reacting to them—something which is not

solely the product of either the stimulus or the reaction considered in isolation. It is in precisely this "happening between" that learning is to be found. From here its principles should be derived, and not from one or the other end of this inter-relational process.

When learning is viewed thus as a dynamic inter-relation between the individual and his environment, the concept of active learning acquires new meaning. So far, the term "active learning" has denoted some activity on the part of the learner in the process of assimilating certain pre-digested material. Thus, for instance, one can discriminate between a passive and an active learning of mediæval history. The former is a process that consists of listening to a teacher's lectures and memorizing the facts in a textbook, the latter is a procedure where the presentation and assimilation of the same materials are aided by illustrations and constructions on the part of the students. In either case, knowledge, judgments, and opinions are handed down. The only actual difference is that conditions under the second method render the inculcation more effective.

Behaviouristic psychology has strongly stressed the fact that learning is in actuality an active process, meaning thereby that it proceeds through some definite activity on the part of the neural organism. Thus Thorndike and Gates give the following definition of learning: "Learning is always an active process. It is never a passive absorption—a mere absorption."[1] Activity they also define as reactivity: "All human activity is reactivity. For every action there is a definite incentive or a cause. Activity is not a sort of spontaneous combustion; it is the response to stimulation."[2]

There could be no quarrel with the statement that activity is not a sort of spontaneous combustion, that it has a cause. Much more debatable is the assumption implied—that activity is nothing more than a reactivity to a direct and discrete cause.

[1] *Elementary Principles of Education*, p. 84.
[2] Ibid., p. 62.

Such a concept of active learning is actually representative of passive learning, seeing that the reactions made are held to be only the necessarily following mechanical counterpart of the external stimulation, having no effect on the stimulation itself and creating nothing in the reactor.

In order to hold consistently a dynamic view of behaviour and learning, it is imperative that this notion of active learning be expanded. Activity is not merely reactivity; it is also creativity. Stimuli are responded to and re-made at the same time. Stimulation does not consist only of externally furnished facts, objects, and things; it also includes meanings, relations, concepts, and these are partly products of the process of reactivity itself. A learner's response to an object as a stimulus is an integrated deposit of all the responses made to that object under different circumstances, and which have made it what it is. Active learning, then, does not imply merely some changes in the nervous functions and the responses; it also implies changes in the objects responded to (or whatever it is that one responds to). While learning one is not merely reconstructing behaviour as a function of the organism or the individual; one also changes the material or content to which that behaviour is directed or related.

In addition to this, we must bear in mind that a vast part of our environment consists not of physical objects alone but of social institutions such as state and church, of collective concepts, such as democracy, patriotism, industrialism, of functional and binding relations between things and events. To all of these concepts and generalizations we respond in a manner very similar to the way we respond to physical objects. We respond to them *as if* existing, *as if* objectively given. Yet these very concepts and generalizations are simultaneously made by these ways of responding to them. They are very definitely created by, and exist in, the responses of each generation.

It is in this sense that one can say that learning is creative; it produces its own environment and it creates

the basis for the subsequent learning. Learning, consequently, is a building up, a synthetic procedure.

This conclusion is in sharp antithesis to the current conception of learning, which is based on the assumption that all learning is analytic.[1] The process of learning, it is held, is that of reaction proceeding from the "cross total" of the situations to more subtle elements of the same situation. That process is analytic in its character.

To emphasize analysis as the only vehicle of learning is to underestimate the creative and constructive aspects of learning—and this, in the long run, is tantamount to a denial of learning. It also involves the pre-supposition of an environment that is statically limited, existing independently of human responses to it as environment.

In the preceding discussion (Chap. III, Sec. V), it was brought out that responses are usually made to a manifold of stimuli integrated into meaningful units. Meanings, generalizations and abstractions are developed not by a process of decomposition only, as the S-R theory proposes, but by constructive organization as well. Elements analysed out of previous experiences are integrated into new units possessed of new qualities, and these new units serve as a material for further reorganization.

Experience is thus a constructive process whereby masses of stimulations, masses of perceptions, objects, and meanings are integrated into articulated complex units, and these units in turn are inter-related in more and more ways. Thus, for instance, in the course of experience, apple-as-a-mere-article-of-food will be transformed into apple-as-an-æsthetic-object, apple-as-a-source-of-income-for-farmers, apple-as-a-commercial-article, and so on. This object "apple" is set into more and more inter-relations with experiences of other types. And more and more elements of those experiences of other types become integrated with the concept of "apple," this

[1] Thorndike, E. L., *Educational Psychology* (Briefer Course), Chapter XII. Gates, A. I., *Psychology for Students of Education*,

concept itself widening those other experiences. This integration of the deposits of different experiences around some one centre is done in the form of a continuous give-and-take. Each new level of organization has absorbed whatever elements it has needed from some previous organization, and has integrated them within its own unity so that they become an organic part of that new organization and lose their previous individuality. Thus, whatever æsthetic notions we may have applied to an apple, probably have been developed in connection with some other objects of experience; yet when they are applied to the apple, they take on the individual quality of the æsthetic aspects of the apple.

Learning as this type of creative reconstruction of behaviour and environment is at the same time analytic and synthetic. The function of analysis is to lift out one relation, or a group of relations, from the totality of the situation; the function of synthesis is to incorporate, to integrate, the relation or group in the set of new relations, within a new wholeness of processes. A reorganization of experience is impossible unless these two processes supplement each other. Without the first, our response would be indefinite; without the second, behaviour would be a disintegrated aggregate of many isolated reactions and perceptions without any organic unity. The importance of this is apparent when we realize that such organic unity is a fundamental characteristic of human personality and behaviour; and that without it experience is impossible.

When behaviour is viewed as an unintegrated aggregate of isolated fragments, the characteristic of fixation as a predominant aspect of learning impresses itself upon the observer. It is natural, then, to find that an atomistic psychology of learning is accompanied by an emphasis on the fixation of bonds, on habit formation, and on the fostering of other fixed patterns of behaviour as an educative policy.

Yet an analysis of the continuities of behaviour acts, an analysis of conduct, shows that the fixed patterns of

behaviour do not play the most important role. Habits, reflexes, and other fixed forms of behaviour are undoubtedly very important. They take care of innumerable situations, and economize energy and attention in the manifold of problems that confront every human being at every single moment of his activity. But what makes human experience human, that is, intelligent, is not its degree of fixity, but its capacity for flexibility. Human experience, in fact, is not to be evaluated by the perfect fixity of its patterns but by their flexibility. It is only because behaviour patterns are flexible that learning is possible. It is only through this flexibility that the deposits of previous experiences can be integrated into new ones. Habits and response patterns in general are valuable to the extent that they serve as flexible materials for the new types of behaviour, to the degree that they become alive in the ongoing of experience. Learning as a reorganization of behaviour is continuously traversing new roads. Past experience helps by furnishing organized materials, concepts, meanings, relations and integrations. It is past learning entirely that prevents us from being constantly confronted by mere aggregates of stimulations, of isolated objects and events. Past learning has articulated and organized our stimulating environment. Yet no degree of organization can be regarded as final. Every level should serve only as a step towards further reorganization.

Thus, the value of past experience does not lie in its contentual deposits as such or in the fixed patterns produced by it; its value is to be found in its role of reorganizing agent of aggregates of materials into units that are readier to yield more complete and appropriate organizations. The accumulation of knowledge and ready behaviour patterns is valuable only to the extent that these can be used as a basis for a better, more appropriate, more inclusively inter-related, more intelligent behaviour. Learning should be evaluated from the standpoint of living experience only. Nothing that yields only dead baggage can possibly be held to be educative learning.

We are constantly warned against inert ideas in education. Whitehead calls education with inert ideas *Corruptio optimi pessima*. And yet despite these warnings so much of the current psychology of learning is emphasizing precisely the more inert aspects of past experience leaving unexplored the mechanisms and possibilities of its utilization in creative learning. Its chief concern seems to be the "fixing" of habits and of bonds. The nature of learning is to be deduced from such "fixings." The processes of learning are explained in terms of fixations. The laws of learning are formulated with the same outlook. Granted that the continuity of human behaviour presupposes a certain amount of fixed patterns, these patterns are not actually the dominating ones, nor does the process of fixation represent the basic nature of learning. The basic characteristic and the true achievement of the learning process is to be found in the integration of the new elements in experiential situations with the patterns of behaviour formed in the preceding experience, and in the remodification of the latter to meet the new demands, i.e. in the flexibility of the patterns.

Whatever patterns of behaviour have been acquired in past experience are fixed in terms of experiences different from those being at present undergone. Any actual situation calls for a response in terms of its own needs; therefore, past experience contributes not by furnishing ready-made patterns of response but by furnishing an increase of sensitivity to more varied aspects of environment and life; by furnishing materials for new organizations and integrations; in other words, by increasing the power of the individual to cope with the present situation. Inert or static elements of past experience transferred to the present situation will not assist but hinder the fruitfulness of present experience.

Progressive education has taken cognizance of the doubtful value of a fixation policy in education. It has tried to stress the dynamic aspects of learning. It aims to foster the development of capacities, methods of thought

and ways of solving problems, interests and powers of judgment in preference to contentually fixed patterns of behaviour and judgments. Also, some attempts have been made to give insight into the leading ideas, key concepts, and fruitful methods of criticism rather than to hand over ready-made systems of facts and factual information as such. Progressive education is on the way towards a reorganization of learning around those aspects of race experience and conduct which do not make for fixation of conduct and judgment but which are fruitful in sensitizing the learner to the changing contemporary life and its problems, and which are productive of a creative reconstruction of the ways of behaviour according to the demands of these changing situations.

This trend of progressive education has encountered severe criticism from those who see the accumulated store of past race experience imperilled due to the abandonment of the traditional methods employed for handing down this store. Progressive education is accused of not giving sufficient attention to what are held to be the fundamentals of all knowledge, skills, and habits.

It is obvious that true learning is impossible without that foundation which the tools of learning and experiencing are to provide. These fundamentals are, in fact, borne well in mind by most progressive school systems. The point of difference is not whether these fundamentals are recognized or ignored. The parting of the ways comes in holding these fundamentals to be means instead of ends. The tools of learning are to be selected by curriculum makers and mastered by learners not as ends in themselves but only as tools, when and because they are so needed. As such they are factors promoting development instead of limitations stulting growth.

A further shortcoming of the emphasis on the fixation policy is that it is inevitably coupled to the atomization of the processes of learning and behaviour. Behaviour consists of integrated sequences of acts, in which the partial acts are subordinated to the total. Every single act comprises many simultaneous partial acts, and the

change effected in one part of the total extends its effects to other partial functions.

This implies that the total organism shares in the effects produced by every single behaviour act. In so far as these changes can be considered learning, learning is multiple. Traditional education has invariably proceeded on the assumption that learning is single, that it develops by mastering one discrete, isolated task at a time. The "learning" of spelling, arithmetic, history, was supposed to produce effects limited to the particular knowledge or skill acquired in those fields. Teaching methods, and the evaluation of possible outcomes, are still formulated today very largely in the terms of such single learnings.

This notion of single learnings predominated due to the narrow range of what was permitted to be viewed as learning. The attention of traditional education, as we know, concentrated on the direct mastery of subject matter, and the multitude of changes in the behaviour of learners produced by occupation with the subject matter was overlooked, or these changes were not held to be educationally important. However, the new viewpoint has effected a re-evaluation of what are to be considered important outcomes of learning, and as a result changes in emotions, appreciations, and other determinants of behaviour, previously neglected, have come to be regarded as most valuable and important learnings, to be carefully considered in the conduct of educational processes.

This concentration on the mastery of subject matter and skills, and on techniques, also permitted a direct or frontal attack on definite subject matter. One set out clearly to memorize certain facts, to learn spelling or arithmetic. Learning effected in this way may be called direct learning. And up to the present it is these direct learnings that have formed the main basis for the conduct of education, and the items of direct learning have been predominant in the evaluation of the outcomes of study.

The development of character, emotions, methods of work and ways of judgment, as well as the general

reorganization of behaviour, cannot, of course, be thus treated. These are products that emerge from the occupation with subject matter or other direct tasks. They are not to be achieved by a frontal attack. Furthermore, while direct learnings can be mastered as single, discrete tasks, learning in a wider sense is necessarily multiple. A change in the educand's appreciation will be found affecting his emotions and judgment, and modifying his responses to other aspects of the environment not directly included in the particular object of appreciation.

Thus we see that preoccupation with direct learnings has resulted in a curious misplacement of educational values, in a dualistic segregation of the outcomes of learning. The direct learnings, as a result of their being subject to a frontal attack, have acquired a primary value. They are considered *the* results of learning, while all other learnings are considered as secondary.

This dualism has worked itself even into educational theories that do not regard the direct learnings as the most important ones. Education that sees the chief value of learning in the reconstruction of behaviour, in the widening of meanings, in the changing of outlooks, in improving judgment and methods of approach to novel situations, in the sensitizing of the individual to a wider variety of values, regards direct learning as a tool, not as an end in itself. Thus, for example, the mastery of reading is but a tool for learning. Facts of history are not learning; the learning is to be found in the effects that the knowledge of some historic material will have on the behaviour of the learner.

Nevertheless, education with this newer outlook has not yet succeeded in reconstructing its practices so that these indirect, yet more important learnings, are treated as primary, as the sole basis for the conduct of education. They are still sought as secondary, though desired, results.

A contemporary theory of purposive learning employs the term " concomitant " to describe those learnings that are the by-product of the occupation with direct learnings.

This term had its origin in the effort to emphasize the fact of multiplicity of learnings, and the importance of the by-effects of direct learning, at a time when these were not appreciated. It has proved a helpful term, and was a significant distinction when originated, for preoccupation then was almost exclusively with subject matter. But in an education aiming at the reconstruction of behaviour in all its aspects, and which thus does not regard mere mastery of subject matter as learning, this term serves to perpetuate the planning of school work in terms of direct learning, and to treat the concomitant learning much as a fortuitous by-product. As a matter of fact, to draw a distinction between primary or direct and concomitant learning is unnecessary in an educational system where the learning of subject matter, the learning of facts and information, are considered an acquisition of tools, of materials for the reconstruction of behaviour, and where the learning environment is created in terms of precisely those concomitants and not in terms of the primary learnings, concomitants being understood in this case as real learnings.

In actual educational practice this viewing of concomitant learnings as a by-product is justified to the extent that traditional requirements imposed on teachers make it impossible to develop certain learnings except as concomitants of that rigidly required subject matter. Where the project method is employed, however, concomitant learning should not be viewed merely as a desirable by-product, not important enough to plan for definitely and explicitly. Though it is true that it is impossible to aim directly at those concomitant learnings, our efforts in creating learning situations should be so directed that the concomitant learnings figure definitely as aims behind the direct aim, and not as something that it is hoped or expected may appear incidentally. Also, direct learnings at present enjoy the benefit of various kinds of teaching devices, of highly developed methods of teaching, and, what is still more important, of much intelligent thought, which advantages

have not been bestowed on the guiding of concomitant learning.

The observation of current practices utilized in the project method shows that though the organization of learning materials in abstract and remote subjects has been overcome, the practical process of teaching and learning is still effected greatly in terms of direct learnings, and not so much in terms of the reconstruction of behaviour. In the detailed reports of project work in schools, the main emphasis is almost invariably laid on the description of different activities performed, on different discrete learnings acquired in the process. The analysis of the reorganization of personality, of ways of behaving, of the development of meanings, shows a decided meagreness, a lack of thoroughness of insight, reveals almost triviality. This situation is not to be attributed merely to the very natural lag of practice behind the best thought in theory; it is due also to the fact that in the theory itself there is no clear understanding of how to provide for the concomitant learnings in their fulness, of how to organize the learning materials entirely from the point of view of learning as the reconstruction of behaviour.

One of the reasons for this serious shortcoming is to be found in the lack of consistency apparent in our theories of purposive learning.

Concomitant learnings are the product of processes involving the reconstruction and reintegration of all the functions of an organism or an individual. An attitude is not an automatic result emanating from the knowledge of certain facts, even though these facts are closely connected to practical life and experience, and are not just a tissue of abstract knowledge; an attitude is a compound result of all underlying organic responses. It follows, then, that in order to guide intelligently such "concomitant" learnings we should devote more critical thought to the ways in which the more elementary psychological functions work together and are re-modified in a unit of purposive behaviour.

The theory of purposive learning at present emphasizes conscious purposing and planning as the main vehicle of active and all-around learning. Purposive learning usually comprises learning which occurs in connection with the pursuit of definite "ends-in-view," the acts of learning which follow the scheme of "Purposing, planning, executing and judging."[1]

This emphasis on conscious planning and purposing as a basis for teaching practice is a sound one. Nevertheless, from the standpoint of an adequate theoretical understanding of the implications of purposive learning, and therefore also from the standpoint of the best conduct of purposive learning, an analysis of the conscious acts of purposing is not sufficient. It is essential that we know the structure of the indirect changes achieved through the pursuit of goals. It is important to know how purposive behaviour affects the basic elements of behaviour, how the reflexes, the organic and emotional drives and the other subtle workings of the psychological make-up, reorganize themselves within purposive behaviour. Without this knowledge it is difficult to gain clear understanding of the problems of simultaneous multiple learning. And consequently, failing this knowledge, it is practically impossible to reorganize teaching in terms of the indirect or concomitant learning.

In the preceding discussion it was pointed out that the characteristics of purposiveness, i.e. flexibility and adaptability to new situations, was not limited to conscious behaviour, but that the reflexes, original drives, and unconscious responses are also reorganized in terms of the direction and needs of the trend followed by conscious behaviour. However, the theory of purposive behaviour in its present stage of development does not explain the elementary constituent functions of a purposive act on the

[1] Kilpatrick, W. H., *Foundations of Method*, pp. 200ff.
Dr. Kilpatrick has since modified his position on purposive learning considerably, but the scheme of purposive learning as analysed in *Foundations of Method* still influences educational circles and schools profoundly. The present discussion refers to these prevalent ideas as influenced by Dr. Kilpatrick's *Foundations of Method* rather than to the position that authority holds at present.

basis of principles applied to conscious behaviour. Thus we have a situation where two different sets of principles are applied to the explanation of the phenomena connected with learning : for some processes the principle of flexibility, of intelligent adaptation is used, while others receive their explanation on mechanistic principles. Thus the theory of purposive learning is using S-R psychology for the understanding of the basic elementary functions involved in learning. The S-R theory, which is mechanistic[1] is merged with the theory of purposive learning. The basic principles of S-R psychology are entirely different from those of the theory of purposive learning. While the latter stresses flexibility, the former emphasizes fixation. This combination of two antithetical points of view is particularly evident in concepts having to do with the reorganization of behaviour, growth, creative activity, all of which are actually based on the antagonistic concepts of S-R bonds, readiness, mind-set, conditioning. These latter are concepts that explain present behaviour solely through certain fixations formed in past experience.

The lack of consistency is obvious. While on the one hand purposive learning is treated as a learning unifying and organizing and reorganizing all functions of the human organism and mentality, the detailed discussion of such behaviour is invariably devoted to the isolated functionings of discrete and fixed stimulus-response relations, or to some secondary unifying derivations emerging from such isolated functions.

It is no wonder, then, that in actual practice direct learnings dominate classroom thinking, and that the

[1] In more recent interpretations of S-R psychology (as, for example) in Thorndike's views as presented in Thorndike and Gates : *Elementary Principles of Education*, concepts such as "multiple response," and the recognition of certain subtler concomitant reactions, serve to soften the original extreme atomism of S-R psychology. [illegible]

[illegible] acts to an analysis of specific acts in the light of the total act, the dangers of atomism still persist. The characteristics of unity are not secondary derivations of isolated processes—which is the impression [illegible] S-R p[illegible] f behaviour ; [illegible] d in the light of such primary unity.

training of certain clear-cut, isolated habits and skills assumes predominance over the wider reconstruction of behaviour, even in those schools where training in isolated skills and habits is not the accepted aim. It is only when all functions involved in the learning process are consistently seen and explained in terms of the basic principles held regarding learning that it is possible for educational theory and practice based on purposive learning to formulate units of work, as well as teaching methods, in terms of learnings which now are called concomitant, and not in terms of direct learnings under any disguise. In other words, it is only when our fundamental viewpoint is consistent that we can have the concomitant learnings definitely in mind in formulating the direct aims and in governing the actual practise.

III

Between methods of testing learning and theories of learning, there exists a twofold connection. In the first place, testing devices are usually formulated in terms of what a theory of learning considers as important results. Every theory of learning has tended to develop means of testing learning that are in harmony with its basic trend. Thus, the traditional theory of learning that stood for the mastery of subject matter by memory was accompanied by examinations, the main purpose of which was to test this mastery. The scientific school, with its emphasis on habits, skills, and the formation of response connections, has devised "standardized tests" that express the basic principles of this school in the form of the tests as well as in their content.

On the other hand, this twofold connection reveals a converse aspect in that the methods employed for testing, and the results revealed by testing, in turn affect the concept of learning responsible for these tests by tending to dictate what is important in that learning. It is obvious that different ways of testing emphasize different types of

results and allow the others to go by unnoticed and unmeasured. This selectiveness or bias is productive of a programme for further learning elaborated in terms of the possibilities and shortcomings of the tests themselves.

The position of testing is consequently of such importance that this subject cannot be viewed with indifference by thinkers in the general field of educational theory. This is apparent when it is realized that success in the application of any theory, and the formulation of that theory itself, depend greatly on the form of testing employed. Educational tendencies, striving to realize some specific aims of their own, are endangering their positions and thwarting the achievement of these aims by unthinkingly accepting systems of testing that are alien to their thought. Almost as important as the development of a philosophy is the establishment of devices of control that are in harmony with that philosophy and which further learning in terms of that philosophy. To the degree that a theory of learning utilizes ways of testing formulated in terms different from its basic principles, the theory is incomplete and impractical in its fullest sense, and is unwittingly working to defeat its own ends.

One of the chief requirements of adequate testing, both as a check on results and as a guidance for further learning, is that there be a positive correlation between what is considered as important learning and what the testing methods emphasize or reveal. Such a harmony existed between the aim of learning as a mastery of subject matter and the examinations that test this mastery. It also exists between the theory of learning as an acquisition of fixed skills, responses and habits, and the testing of these achievements by standardized tests. But in the case of the theory that views learning as a reorganization of ways of behaviour and as the acquiring of more intelligent and more appropriate patterns of behaviour, results as yet cannot be adequately tested because testing methods compatible with the theoretical basis have not been evolved, and testing has been done largely with

devices borrowed from other, and often decidedly antithetical, systems.

The discrepancy between theoretical bases and testing procedure is particularly evident since the spread of standardized tests. Standardized tests have of late become an almost universal means for testing learning, and progressive education has adopted these devices in spite of the fact that its theory of learning differs radically from the one that produced such tests.

While standardized tests are an invaluable tool for scientific education, they possess their limitations and shortcomings. An uncritical usage of this tool can result only in harm and will also serve to defeat the good points it may possess.

What can the standardized tests test, and how far can they help that education the main aim of which is to foster a creative reconstruction of behaviour, to produce personalities with well integrated outlooks, and to promote the development of ever increasing abilities to deal with new problems ?

Let it be first of all admitted that standardized tests have rendered most valuable service to the teaching of fundamental skills, such as reading, arithmetic and spelling. They have also been helpful in guiding training in certain skills and habits. There is no doubt that they far surpass the old-time hit and miss judgments of teachers in their accuracy, objectivity and diagnostic value. Furthermore, as the acquisition of elementary skills, habits, and emotional responses is a very important part of learning under any theory of education, anything that renders more accurate information as to achievement in these fields of activity is of definite assistance to the conscious guidance of learning. Possessed of the ability to test skills, habits and elementary attitudes accurately, education has been in a position to know more clearly what it seeks and to construct more consciously means to achieve its aims.

But it is also true that for evaluating or studying appreciations, general abilities, emotional factors, and the

motivation of behaviour standardized tests have proved a much less reliable tool. A wholesale and uncritical adoption of these devices is fostering practices and concepts that are decidedly not in harmony with the aspirations of progressive education. An examination of some of these salient discrepancies will not be amiss.

In the first place, standardized tests are atomistic and mechanistic. They test single responses, isolated habits and skills, and segregated bodies of information. Their method is that of the compilation of the whole from single items evaluated in separation from the whole. They proceed on the assumption that experience is an aggregate of various functions and acts that can be treated mechanistically. They assume that an improvement of behaviour can be brought about by effecting changes in its isolated elements, and that this improvement can be adequately evaluated by the simple process of adding up the discrete achievements.

Diametrically opposed to this is progressive education conceiving behaviour and learning as a unity of activity, where the whole organism is participating to the extent that in every partial act the total organism is involved in one way or other. Consequently, to test isolated elements of that behaviour as units unto themselves is not only insufficient but is even detrimental to the furthering of learning in terms of organized, unified behaviour. For this one must judge the elements of behaviour in their connection with the whole, one must start with the whole and proceed from that to the elements. The method employed by standardized tests is precisely the opposite: from the elements, considered independently, the whole is compiled, which in this case is not a whole, but an aggregate.

Progressive education, furthermore, works on the assumption that many different learnings are taking place simultaneously with any specific act of learning. The acquisition of one habit tends to modify other habits, as well as other emotional and mental reactions. The

learning of one fact has its influence on the reaction to other facts. It is therefore held impossible to evaluate learning by measuring just one single learning at a time and by itself, as standardized tests necessarily do. Learning is an organic process and proceeds by laws governing organic processes, whereas such testing is mechanistic and evaluates learning by following mechanistic laws. Learning proceeds by patterns, in which partial functions are subordinated to the total behaviour pattern. In testing with standardized tests, partial functions are judged as if they were independent functions.

It is precisely this atomism and mechanism that has made standardized tests accurate evaluators of skills, habits, and informations, yet at the same time has made them incapable of coping adequately with attitudes, emotional reactions, choices and values. These latter are patterns of behaviour that inherently do not express themselves in single isolated elements of behaviour. They are produced by, and can be seen only in, larger meaningful wholes.

In this connection, the usual defence evolved in favour of the standardized test is that it is a device as yet too new and undeveloped to include treatment of the more complicated units of behaviour, such as those having to do with emotions and value reactions. There appears, however, to be sound grounds for questioning whether standardized tests will ever be able to cope satisfactorily with these aspects of behaviour. It seems reasonable to presume that the difficulties experienced at present in these more complex fields are not to be attributed to the youth of these techniques but are rather the result of inherent unsuitability to the task confronting them—are the result of endeavouring to make atomistic and mechanistic procedures fit processes that cannot be dealt with atomistically or mechanistically. If such be the case, no amount of supplementation or refinement of the present forms of tests can overcome so fundamental a fault. The remedy must lie in radical changes in the basic methods and forms of testing.

Standardized tests, in the form they exist at present, emphasize as important those learnings which cannot be considered as such in education for the reconstruction of behaviour. Schools working on the latter principles are introducing a conflict in their own practices in leaning too heavily on standardized tests. These schools stress unity, meaningfulness, and an integrated multiplicity of learning, yet they test aggregates, isolated functions, and single meaningless results. They hold integration to be one of the most potent factors of learning, yet their testing almost completely neglects it. The dangers of this situation to the consistency of progressive practices should be obvious.

In the second place, the analysis on which standardized tests base their technique and their method of evaluation is strictly quantitative. The basic items selected for rating either are derived from values honoured by former theories of education, or they are chosen because of their fitness for quantitative manipulation in a "scientific" manner. They are not selected exclusively because, in the light of current theories, they might be held to be the important and most valuable aspects and elements of learning. In an evaluation of individual achievement or ability on the basis of the items thus selected the *how much* and not the *how* or *what* forms the basis of comparison. Thus, for instance, intelligence tests are predominantly measuring different degrees of the same aspect of intelligence, with qualitative differences almost ignored, a point that has been the source of so much controversy between liberal and vocational education. In this case in particular, it is felt that the present form of intelligence test over-emphasizes abstract, intellectual types of intelligence, and fails to do justice to such types as vocational and social intelligence. The same shortcomings are evident in the measurement of achievement, character, and ability. Thus, for example, if we endeavour to measure "patriotism" by means of standardized tests, we find ourselves unable to compare one kind of patriotism with another; learners can only be sized up as having more or

less of the particular type of patriotism accepted as a standard by the testmakers.

In most cases all learnings, achievements, abilities, and traits which cannot be rated quantitatively have in effect been excluded from the testing, and only those which lend themselves to numerical treatment have gained admittance. This discrimination can be traced very definitely to the adoption of so-called " scientific " standards, which in reality is the result of borrowing the techniques of quantitative, physical sciences.

Most aspects of learning and changing behaviour demand a qualitative appraisal in order to be evaluated at all. Changes in the behaviour of individuals and in the contents of their experience are of individual quality and value, and need to be appraised as such. The most important and most crucial differentiations with which education has to deal are not those involving varying amounts of the same type of achievement, but those involving qualitative differences in achievements and ability, differences in the qualitative content of the experience of individuals. Learning, it seems trite to repeat, is not merely an acquisition of so much of this or so much of that. It is not limited in its results to the values arbitrarily fixed in the testing items. Its results are not such as to be subject to quantitative assortment along the percentage line of certain fixed values or achievements. Learning is a process involving qualitative changes in both the individual and the experiential materials. In addition to that, the *more* in reference to learning of necessity also should include the *different*.

Education deals primarily with the creation and recreation of values, with things that have a decided qualitative aspect. Consequently, it follows that the evaluation of learning is primarily a problem of comparing and judging qualities not quantities. The *more* or the *less* of the things learned or the ways of behaving cannot be as important as their qualitative differences.

The dangers of this quantitative thinking in education, following the widespread usage of standardized tests,

would not be so serious were it not for the fact that these tests are acquiring a monopoly on the judgment of educational outcomes, and are often regarded as the sole adequate and accurate tool for this purpose. Their usage is not limited to those tasks for which they are well suited, for no discrimination is made between what ought, and what should not, be subjected to the standards of quantitative measurement. Often most important predictions of behaviour or of the consequences of educational methods are based purely on numerical estimates, and are thus decidedly misleading.

It cannot, of course, be said that qualitative ways of testing are entirely absent in our present progressive schools. The trouble is that these qualitative ways are not critically, consciously, or often enough applied, and in the general appreciation of the results of teaching progress they are usually almost completely eclipsed by standards and results that are the product of the quantitative ways of measuring.

And finally, standardized tests evaluate static results. They measure what learners know, master and do as final, short-range achievements. Little or no heed is given to those capacities and achievements that will help the learner to build up a dependable sequence of thought and judgment, to methods by which problems are attacked, to comprehending principles, to organizing ideas, to the formation of guiding concepts, to trends of interest—in fact, to all those aspects of learning which are not exactly and concretely present in any single task of learning, yet which are a necessary basis for all experience. Standardized tests do not deal with these, because judgment on such aspects cannot be made on the basis of isolated elements of experience; what is required here is an analysis of comprehensive units and sequences of behaviour, estimated in their relation to each other.

Short-range achievements, such as skills, habits, information, certain discrete ways of responding, mastery of the elementary tools of knowing and experiencing, properly

chosen, are very important. But still more important results of learning are represented by the basic methods of thought and experience, the principles and ideas, that help the learner towards creatively constructive and challenging realms of activity and thought. If education is viewed not as a temporary business during which a certain amount of essentials has to be mastered for later use, but as an introduction to the methods of thought, the ways of judging, and the means of intelligent dealing with problems, then these latter achievements acquire much deeper significance and a weightier importance than the short-range end-outcomes of the mastered finalities. Dynamic education is concerned less with the fragmentary end-results, than it is with the development of a basis for a method of experiencing, and with a disposition to continue building up a sensitive, consistent and intelligent understanding of life.

These are patterns of behaviour that realise themselves only over long periods of experiencing, and that are to be judged only in relation to a series of continuous yet diversified tasks. They cannot be observed fully and completely in connection with any one single problem or task.

This is also obviously true of character traits, even of some forms of integration, some meanings, where full fruition demands long periods of experience. If testing is applied only to immediate results, or to data that are solely the result of immediate conditions, as is largely the case with present methods of testing educational outcomes, the conditions under which outcomes of the remote or deferred type emerge remain unknown. Their fulfilment, consequently, is left to chance. When these deferred results appear, their understanding (if this understanding is to be adequate) demands knowledge of the generic factors involved in their creation. On this important process our testing, dealing with static achievements, is in a position to throw but little light.

Such a serious deficiency in our methods of testing is well reflected in the organization of work in progressive

schools. Projects are developed as individual units springing from incidental interests. They show but fragmentary educative possibilities, but little continuity in relation to the consistent expansion and widening of the range of experience and still less in relation to consistent and cumulative growth of the means, tools and processes of experiencing itself. It would be difficult to find even retrospectively in any schools at present, a programme of educative experiences embracing the whole school in terms of continuity of unified growth in the projects and their contents as well as in the educative experiences and learnings produced by them.

This defect, of course, is largely attributable to the newness of this type of organization of education and to the restrictions still imposed on progressive education by traditional demands for concrete and definite "school achievements." Also, the project method, because of conditions prevailing at present, is to a large degree the responsibility of individual teachers, as the ways leading to co-operative thinking on the part of the entire educational enterprise have not as yet been worked out in a satisfactory manner.

Yet even considering all these restrictions, there is ample evidence of the lack of effort to provide for consistent and continuous growth of experience and experiencing, which can be credited to lack of knowledge as to what outcomes and what learnings are important from this new standpoint and what should be the sequence and organization of educative experiences in order to produce a well-integrated and well-organized body of knowledge, attitudes, and modes of intelligent thinking and behaving.

This situation, in turn, perhaps can be credited to the meagre knowledge that we possess of educational results that are not the immediate product of learning or teaching processes. The project method, in this respect, has been justly criticized for the incidental character of its learning results.[1] But the remedy does

[1] See Bode, *Modern Theories of Education*, Chapter VII.

not lie in the direction suggested by these critics, who propose a subordination of the continuity of the learning process to the logical order of systematized knowledge. It lies rather in the construction of this continuity in terms of the processes of learning and growth themselves.

All behaviour has a natural cumulative and organic continuity. So has learning. But obviously this continuity can be furthered by intelligent criticism and by direct efforts in this connection, just as it can be impaired by dualism and atomism. As the task of the school is to guide the growth of children, the school must be sensitive to the ways of becoming of those characteristics of growth that are the result of long periods of experience. And it must also be sensitive to the more remote possibilities of growth that lie at every step of learning.

An educational theory that accepts learning in this light cannot rest content with testing as it exists in its present forms. To accept such testing as a sole and ultimate measure of learning is to run the risk of defeating one's own ends. Testing, it is important to repeat, cannot be merely a form of control seeking to record progress made in the teaching process; it must always be a method of evaluation, and to that degree also a formulation of the educative process itself. But this educative process cannot be formulated once and for all—at least a dynamic process cannot suffer such fixation. It is constantly re-formulated in the light of the evaluation of its outcomes. And if testing fails to evaluate adequately the outcomes at which the process of education is aiming, it fails to provide the essential criterion, the fundamental basis for the formulation of methods, especially if the basic principles on which the testing is founded is in contradiction with the basic principles of the theory of learning. Creative teaching and learning demand creative ways of testing. There must be consistency between these two processes.

Consequently, creative schools, which are aiming at a dynamic activation of the results of past experience in present and future behaviour, at the liberation of powers of thinking, and at a richer and wider experiencing, work

under a formidable and serious handicap through the lack of forms of testing that are in harmony with their aims and adequate to their purposes. After all, one teaches only what one, in some way or another, is able to evaluate as an outcome of that teaching. If we are unable to evaluate the growth of integrations and meanings and ways of behaviour, we are unable even to form an adequate notion of them, still less to guide the process of learning in these terms.

There seems ample reason for believing that standardized tests, whatever refinements and elaborations they may undergo, will not be able to meet the demands of our rapidly-developing concepts of education and serve as the sole tool for the testing of learning. The aspect of standardization itself is a negative one, for standardization introduces uniformity, and uniformity can be applied only to processes that are predominatingly recurrent. Learning as we view it today must be individual and unique in its actual outcomes, and this in a qualitative, not in a quantitative sense. Learning's most precious characteristic, we believe, today, is creativity, the attainment of something new and different. And for the products of individual creativity, measures that come from uniform and technical standards are hopelessly inadequate if not absurd. The standardization of educational tests originally had as its aim the understanding of individual differences, but this purpose is defeated by their limitation of individual differences to quantitative differences only.

Furthermore, standardized tests rely on technique, and technique of any kind can cope adequately only with processes in which a considerable amount of uniformity is present or which are subject to control through the particular technique adopted. Neither of these conditions is possible in true learning. The development of experience and of the materials of learning do not stand still while technique for their testing is worked out—a thing that always demands a considerable amount of time —and consequently any educational technique will be to a certain extent behind the times. Thus a disparity will

always exist between a creative experience like learning and any technique devised either to evaluate or to understand it. To the degree then, that both learning and teaching are evolving and creative processes, to that degree they cannot be dealt with through formalized techniques.

Standardized tests, therefore, are to be applied as partial measures only, and must yield in supremacy to other more flexible means of evaluation. Other measures for the evaluation of learning are already in partial use. Among such, the evaluation of the outcomes of the preceding work through observation of the capacity to deal with successively more difficult and more complex tasks may be mentioned as one of the most adequate of these newer forms. The results of one unit of work are evaluated in the light of the efficiency and productivity with which learners are able to participate in a succeeding unit of increasing difficulty. Evaluation of this nature employs the process of learning itself for its own evaluation. It uses cumulatively comprehensive units of work as a means of testing. Examples of this type of testing are to be found in school debates, in the execution of comprehensive projects embracing the whole field of work, in school diaries, class books, newspapers, and exhibits where these are conducted in terms of the principles governing the progressive educational practices.

These forms of evaluation, of course, suffer the disadvantage of not being quantitatively accurate. The items evaluated cannot be clearly differentiated from each other and cannot be numerically or statistically manipulated. Yet on the other hand, such methods, when sufficiently elaborated, are rich in great possibilities. These, however, can be fully explored only after an exhaustive study of the units of work in their relation to the continuity of growth and learning achieved. Here evaluation is not limited by any fixed technique. Unlike a process governed by a technique, fresh judgment can be brought to bear upon outcomes for which a technique would have made no provision. Such a method of

measurement does not hinder the possibility of a new qualitative evaluation of learning demanding such evaluation. Furthermore, this type of testing contributes to the learning. While traditional testing methods have offered no challenge to the learner besides the one of mastering the examination, testing by the presentation of tasks of successive difficulty is cumulatively challenging the powers of the learner and is able to stimulate new interests.

In connection with the question of testing, the important matter of self-testing cannot be ignored. When learning is to be an active reconstruction of behaviour and the learners are to be truly active in that process, some means of self-testing are essential. Standards and means of criticism have to be developed to insure the adequate and successful direction of any activity. Likewise, in the case of self-directed learning, standards and means of self-criticism are necessary. Thus, along with the testing of learning by those who direct it must go means of self-testing. However, dynamic education aims at the integrity of self-directed experience, and in an active process of learning, the learner is charged with the responsibility of building his own experience. Consequently, it is not sufficient that a learner know just where he stands at any time as to achievement or particular shortcomings. More than just this form of self-criticism is required for the fullest realization of the aims of dynamic education. The learner needs to gain an insight into the methods of work in relation to the outcomes of work, needs to learn something about his own possibilities and limitations, as well as about the processes by which the mental activity is able to elicit generalizations, judgments, and ideas from concrete experience. He needs to know the factors and conditions governing his successes and failures as well as the means for increasing the possibilities of the first and eliminating the chances for the latter.

Moreover, the power of self-criticism is one of the chief assets of an educated person. When learning is not

thought of in terms of ready-made tasks to be mastered, but in terms of the creative up-building of experience, it cannot be conceived without an intelligent self-criticism exercised at every step of the work. The project method tries to further initiative on the part of learners and the planning of their own work. But equal attention has not been given the need of developing means of self-criticism and self-testing, the bases on which rests the ability to plan intelligently and successfully. In view of the neglect of this important aspect of learning, it is not surprising to observe that projects and work planned by students are so often superficial, shortsighted, and lacking intelligent insight into the value and possibilities of the tasks undertaken.

Self-testing devices have been developed in schools using individual instruction as a method of teaching, as, for example, the elaborate self-testing devices used by the Dalton plan. But these devices again are limited to the mastery of certain tools of learning, certain elementary skills and achievements. At no moment are they capable of being used for the measurement of the growth of learning and experience in *toto* and for the understanding of the structure of this growth and experience. Thus it is that we find the more fundamental and important aspects of learning almost invariably excluded from the field open to self-testing. Through the current devices, students are able to test only certain fragmentary outcomes. They are not enabled to gain insight into the relation of a particular result to the growth of their total experience, and to the development of their powers of work and their ability to integrate in an increasing degree the fragments of single learnings into the wide stream of intelligent experience.

What is most important is that these devices test only the result. There are no provisions for testing the process by which that result is produced. For a truly active reconstruction of experience, an intelligent appraisal of the processes of learning and the methods of learning is more important than that of the results. The value of

single results is a transitory one, whereas intelligent methods of work are ever productive of new outcomes. From the standpoint of the ongoing of experience, the methods employed for the reorganization of experience, the processes of learning, are infinitely more important than any result at any stage of that process.

CHAPTER VI

AIMS OF EDUCATION

I

THE question of educational aims and the problem of an adequate method for their finding and formulation are at present in a state of confusion. The traditional philosophic systems, together with the structures of ideals, values, and social institutions which ordinarily have served as a basis from which the educational aims have been derived, have crumbled. Familiar standards thus have lost their value as educational directives, and the new educational theories, as yet unable to translate their general principles and outlooks into practicable principles, find themselves torn by numerous conflicting trends.

A common verdict pronounced on present-day education is that it is shiftless and without direction, without *an aim*. To some extent this criticism is true. The aims proposed by different trends of education are many and often conflicting. A clarity of principle and conscious direction are lacking. Aims represent an aggregate of various more or less immediate ends rather than a unified and unifying body of views regarding crucial educational issues and the ways of dealing with them. They range from the definite objectives provided by specific subjects or vocational activities to broad speculations on culture and civilization; from specific habits and skills to the ideal of self-realization of personality; from a sum total of all things learned to general abilities and powers of the individual to participate in the business of living.

Because of this lack of a consistent and critical philosophy concerning the values of life and the direction education should take, there are no generally accepted standards to go by in educational choices and evaluations.

The perspectives are blurred, and any one of many accepted objectives can easily acquire an importance equal to or superior to any of the others, according to the emphasis that one chooses to give. As a result, we frequently find major and fundamental educational values confused with the specific and minor objectives, and authorities in specific subjects or in specific vocations attempting to determine general educational aims in terms of their own particular fields.

But to a far greater extent the feeling of instability in education comes from the fact that educational thought cannot reconcile itself with the impossibility of subordinating all educational activities under one single, ultimate and absolute aim, *an* aim, as was done by traditional theories. Our mentality unfortunately has grown accustomed to expect static unity and singleness of direction provided by final and absolutistic standards. Consequently, a varied and apparently conflicting multiplicity of aims immediately connotes lack of direction in the educational outlook possessing them.

It is evident that, in view of the philosophy of life predominant at present, it is impossible to find an aim or an ideal for education which, when understood as a final end-state, or a final end-achievement of educational efforts, will be perfect enough and inclusive enough to cover all our educational values and to represent all educational efforts in the form of one single unit. Whenever educational aims are conceived as contentually determined end-states of achievement, a multiplicity of disorganized objectives is unavoidable. Educational values are many; cultures, social organizations, and institutions change; personalities are of a very different type, and so contentually there can be no ultimate ideal end-state to serve in the orientation of either the society or the individual.

Nor does it seem possible to unite the diversity of definite and contentual ends or aims in one logically consistent and closed system of values. Even if such a thing were possible, it would be quite undesirable as it

would ultimately mean a limitation of future possibilities imposed by present actuality.

Contentual aims are of necessity pluralistic, as is, in fact, any concrete actuality. The unity, and the logical as well as the philosophical consistency that is sought in educational directives, are not to be looked for in the contents of any particular aims held ; they are to be found in a balance of divergent directions effected by criticism based on functional and methodological standards of judgment. This involves a consistent thinking through of the meanings and consequences of different particular aims in relation to each other, in relation to what at any particular moment is held as most valuable in life, and in relation to the liberating power of the educative experiences promoted by the aims held.

It is in such a functional approach to educational aims, in such a basis for a continuous re-evaluation, that education has to look for the organization and direction of its thought and practices.

In this functional approach no effort would be made to attempt to fix a final contentual end-state as an ultimate educational aim ; effort would be directed to the formulation of unifying and stabilizing standards of criticism, applicable as methodological tools in evaluating all evolving, temporary, and specific contentual aims. Educational aims thus considered could not be attached to any particular achievement. They are to be pictured as moving aims, applying themselves to new forms, to new outcomes and values as the educational situations change.

The function of an aim in ordinary behaviour is to organize activity, to render a basis for choices, valuations and different courses of behaviour, to unify effort, and to help evaluate partial activities in the light of the whole act. Dewey has pointed out three major functions of an aim :

" In the first place it involves careful observation of the given conditions to see what are the means available for reaching the end, and to discover the hindrances in the way. . .

In the second place, it suggests the proper order or sequence in the use of means. . . In the third place, it makes the choice of alternatives possible."[1]

From the standpoint of one isolated act the end-aim seems to be the sole directive. However, from the standpoint of long-span continuities of behaviour, it is not the end-aspect of aims that is important, but their role as organizing agents. An aim as an end-state has only passing value, while its influence on the organization of behaviour entails more or less permanent effects on behaviour yet to actualize. And the more comprehensive the aims, the more extensive is that effect.

Educational aims in this respect do not differ from those of everyday behaviour. They are temporary and changing moments in a continuous process, and consequently are to be regarded primarily as agents, the outstanding value of which is not their role as end-states, as final and ultimate achievements, but their capacity to free, direct, and organize activity, to help evaluation and choices.

Aims, when understood as contentually limited end-states, necessarily limit activity. But educational aims should serve chiefly to liberate activity. In order that the major educational aims may be truly liberating forces, they must be stated in functional terms, in terms of values that are not finalities but which, when achieved, will serve as means for producing new values, whatever their specific nature. Their formulation should be such that they can be used as criteria for criticism and choices irrespective of the specific content or nature of the educational process or its outcomes. In other words, one should conceive of major educational aims in terms of the methodology of critical educational thought, in terms of ever new appraisals of a multitude of specific aims in relation to a unifying direction and a consistent outlook; they cannot be viewed as attached to any definite outcome or end-state.

The problem of educational aims, therefore, is not to find one ultimate aim but to build a basis for sound

[1] Dewey, John, *Democracy and Education*, p. 119.

judgment, for a clear and consistent educational outlook. It involves sifting from the multitude of temporary contentual values those which are challenging and productive, and which offer liberating and organizing effects on educational thought functioning in theory and in practice.

II

With the static view on life and education, the formulation of educational aims was a comparatively simple matter. One needed only to look into the state of affairs at hand, pick out the best aspects of it, formulate an ideal of future society and of the individual members of that society, and then proceed to mould the future generation according to that aim. In an undemocratic society, where the minority of thinkers and rulers had the power to determine the course for others, the procedure was still simpler. In this case the ideals of state and social organization usually also served as ultimate bases for educational aims.

This method of formulating educational aims had the advantage of simplicity and singleness of direction. On the other hand it possessed the disadvantage of subordinating education to ulterior aims and thus robbing this potent factor of social development of its fruitfulness. Education, by accepting as final the values and ideals current at the time, was unable to effect their critical reconstruction. This latter shortcoming was accentuated by the fact that the individual was thought of and treated as a neutral and passive unit, to which education ministered the ideas, judgments and outlooks prescribed by aims thus derived.

A dynamic conception of life and education places a new responsibility on educational thought. Its task is not regarded as the translation of existing ideals and values into educationally transmissible materials, but as the evolving of these very ideals and values. It is expected to contribute constructively to the formulation and re-formulation of educational aims and not to limit

itself to the deduction of these from some ultimate ideals held as final and derived apart from the process of education. Education today cannot be thought of as a passive servant of social forces; it must enter as a constructive agent in forming and directing these forces. Its task is to furnish conditions for the ever fuller realization of potentialities, both social and individual, which constantly evolve through the very process of education. The possibilities of such a task are as yet by no means completely explored. It is clear that the educational reconstruction demanded by this new outlook on life goes farther than a mere revision of the methods of teaching, or an addition of a few new subjects to the curriculum—innovations to which educational reconstruction at present has too often limited itself. It demands a development of different standards to judge by, of different aims to follow, and of a different methodology to go by.

In this search the traditional systems of philosophy, as well as those of outlived social ideals, have been discarded for a fresher analysis of the needs of life and, consequently, of the tasks of education. One of the first steps taken in this direction has been the effort to bridge the traditional gap between education and life, and in this considerable progress already has been made.

Unfortunately, these efforts have too often been crippled by partial notions of what life and its needs are, and by faulty methods of analysing its fundamental values. Also, the role of education itself has been much misinterpreted. As a result, the conceptions of educational aims have entangled themselves in one way or another in static outlooks. The transmission of survival values only has maintained a supremacy over the constructive reconsideration of traditional tenets and over creativity through education. These influences inherited from the past are a restraining hand preventing education from assuming that leadership to which it aspires.

Several factors within educational thought itself are responsible for this tendency of education to persist even today in the preservation of existing values and forms of

living rather than to attempt their creative reconstruction. One of them is to be found in the conception of educational aims as contentually defined end-outcomes, as discussed in the preceding section. In most attempts at educational reconstruction the formulation of aims is guided by and based on some definitely circumscribed picture of an end-result, which, because of its contentual definiteness, is necessarily derived from some idealized forms of existing values, institutions, and aspirations. By forcing education to serve such ideals, we deprive it of the possibility of a continuous reconstruction from within. Thus one can truly say that in so far as education is directly or indirectly serving predetermined ideals it is (in spite of efforts to have it otherwise) concerned chiefly with the transmission of survival values, and to a much lesser degree with the creation of new ones.

This is true of most of the forms of educational reconstruction in evidence today. The attempt is made to reconstruct education by re-formulating the contents of aims, which again are set up as static ends to be served by education. This method invariably results in the projection into the future of values operating today, and in cramping the creative possibilities of educative experiences by externally-set limits of achievement.

Furthermore, the practice of re-formulating educational aims in separation from the total process of the educative experience leads to a misconception of the reconstruction of education. True reconstruction can come only through a reconstruction of all the important factors of the educative process—namely, its specific processes, its subject matter, and its aims—in their actual interrelation. The reconstruction of any one of these elements alone and in separation from the others not only is insufficient and ineffective, but also it introduces a dualistic segregation of factors that are inherently interdependent.

Such a method is also conducive to an over-dependence on the present or past in forming the policies of educational procedure. In the constantly evolving process of

life it is dangerous for any system of education, in determining its direction, to take too much stock in a concrete picture of the ideal behaviour of today. No matter how well a certain group of ideas or values may function today, no matter how well fitted certain outlooks may be for the present time, they can at best serve only as a basis from which the educational experience is to take its start, and in no case can they figure as the final ends to be achieved by that experience. To fix the future patterns of behaviour by making them conform to a predetermined ideal and by directing the educational processes so as to produce those patterns is to limit the results of the educational process and of learning to these patterns. And as long as there exist no criteria by which we can truly evaluate our present patterns as the best possible, such a procedure harms and retards progress.

The danger of taking too hard and fast a cue from our present state of affairs is especially apparent in the so-called "job analysis method" of curriculum reconstruction.

This trend in education (which has acquired the name of "scientific education" because it makes use of "scientific" devices—chiefly statistics—in its efforts towards an exact determination of aims and objectives as well as of curriculum materials) originated in the justifiable discontent with the academically-aloof and statically-fixed education. It proceeds by first tabulating the activities (mostly vocational in character) of present adult society. These are then analysed into their component elements (i.e. jobs) for the subsequent discovery of the detailed skills, habits, knowledge, attitudes, and emotional responses necessary for the efficient performance of those activities. These fragments are then set up as the objectives of an education that has to provide for their sufficient drill by the learners in order to produce an "ideal human being and efficient citizen." The proponents of this "scientific education"[1] consider such a

[1] Bobbitt, F., *How to make a Curriculum*. Charters, W. W., *Curriculum Construction*.

method of formulating educational aims an adequate effort to bring education up to the changing needs of life.

There is no doubt that the "scientific method" of curriculum construction is able to supply education which is closer to actual life than was the education directed by speculative aims derived from an absolutistic philosophy accepting an unchangeability of ideals and values. At least abstract *a priori* aims and ideals, often really idealizations from a bygone past, are replaced by those found in actual experience. Consequently, such a process of determining educational aims shows a decided advance over the former conception of education as a wholesale transmitting of cultural values established in previous ages, irrespective of their application to actual experience.

Yet on the other hand, in spite of this liberation from some ideals and values no longer current, and from subject matter no longer useful in actual life, education based on this approach is still primarily interested in the transmission of survival values and in the preservation of those modes of experience which have proved useful in the past, without indulging in or provoking sufficient critical thought as to their educative value or their desirability.

By uncritically accepting the present forms of life as presumably ideal, this trend in education cultivates a subservience to values, ideals, and forms of conduct which society has unconsciously evolved, and because of this subservience it is far from being in a position to enable education to fulfil its mission of reconstruction of experience.

The question of educational aims cannot be disposed of by the mere enumeration of existing values, however exhaustive this enumeration may be, particularly if educational efforts are to go further than a conscious preservation of influences which society has unconsciously, and for the most part accidentally, evolved. Some sort of constructive philosophy, some methods of

constructive criticism, have to be applied in order to assure the choice of values necessary for the good education and the good life. Such a critical appraisal of fundamental values is lacking in the "scientific education" and therefore it is not far from the truth to assert that in so far as our present education has adopted such a trend, it is aimless. At its best, the whole process offers us only better methods for preserving certain values and modes of experience evolved so far.

A still more serious defect exists, however. The scientific trend in education, concerned chiefly with the re-formulation of the more immediate and concrete aims of education, has nothing to offer us in connection with the major directives of education. It has tacitly accepted as its major aims the traditional classifications of fundamental values without any attempt at their critical reconsideration. Indeed, it has so construed the processes of education that it is powerless to bring any constructive thought to bear upon those values.

Under the formulations of major aims that the "scientific method" gives us we find concepts like "good citizen," "cultured man," "efficient participation in life," all very challenging targets for creative educative efforts —when bestowed with proper meaning.

However when these general statements are correlated with the positive qualitative content into which such objectives have to be translated in order to become directives of practice, one can see that the actual meaning of these concepts is derived purely from current notions, often not even revised in the light of newer ideas and practices. Under such circumstances it is evident that the "good citizen" of today cannot picture the "good citizen" of tomorrow. And even could we, through the control of social forces, maintain unchangeable our sense of values and our social demands, it is most unlikely that such a perpetuation of the present state of affairs would be desirable.

Any unqualified objective must either remain a blanket term or it must be filled with varied meanings bestowed

on it by individual preferences and beliefs. As a recent writer has expressed it:

"When an educational leader declares that he strongly favours this familiar objective (citizenship), we require enlightenment to know whether he advocates military training in high schools, or instilling internationalism dogmatically, or some less extreme forms of education for citizenship."[1]

In other words, such general blanket objectives have to be accompanied by some philosophy which will give a basis for thinking with those concepts, a direction as to the meaning that they should have. If this is not done, the specific interpretation of such objectives is in the hands of whatever opinion is dominant at the moment. And, naturally, with such casual interpretations and without a challenge to critical thought, it is the *status quo* that will determine the actual aims of education.

The dangers inherent in this uncritical acceptance of the *status quo* are multiplied by the type of practice proposed by this method for the determination of educational directives. An efficient and exact scheme of what education is to produce demands equally exact and efficient educational engineering. In fact, the precision employed in the listing of objectives, coupled with the admiration for "scientific techniques" has suggested a similarity between educational thinking and technological planning. The development of curricula becomes the making of "educational blueprints." The analogy to the technical arts is carried so far that, as a machine part may be cast and moulded from a drawing, so a number of the proponents of scientific education presume that the ideal citizen may be moulded once his appropriate activities have been accurately charted. An extreme expression of this point of view is to be found in the following quotation:

. . . "Education [is] a kind of engineering. The engineer first plans the object he wishes to make, the house, the bridge,

[1] Bruce, William, "Whither Secondary Education?" in *Educational Administration and Supervision*, 1929, p. 341.

the electric transformer, the railroad bed. He sets up his plan in the form of a detailed blueprint, and studies the adequacy of each of its parts from the standpoint of established theories. After he has perfected his blueprint in every detail, his next step is to have the plan embodied in concrete materials. Now, precisely the same procedure characterizes the new education. Our first step is to get the blueprint of the individual and of the society we want—a detailed picture of the good citizen, the man of culture, the vocationally efficient person, indicating the specific ideals, skills, bodies of information, attitudes of mind, prepared judgments, abilities to reason, which are needed for getting on in this life. Our second step is then by using such instrumentalities as school subjects, discipline, and example as tools, to forge out individuals to conform to those blueprints."[1]

Because of its extreme form, this explicit statement may not find general approval even among those holding to this author's school of thought. Yet there is no doubt that in the main this attitude is widely prevalent. It is attractive to those superficially impressed by the achievements of science and the role science seems to play in the control of our social and economic affairs today.

It is scarcely necessary to point out that the philosophy of life implied in such points of view is that of the unchangeability of life, even in its most detailed aspects. It is assumed that at least from the moment the blueprints are made until the time when youth educated on the basis of such a scheme enter life, the same blueprints will still be accurate and still hold good as exact patterns of behaviour. It is also assumed, that theoretically it is possible to form an exact and detailed picture of the "good citizen of tomorrow," of the "efficient vocational man," or of the "cultured man of tomorrow," as it is also assumed that it is possible and desirable to produce individuals modelled efficiently on such patterns as we at present hold desirable, good and efficient. These are all notions typical of the machine age, minus its aspect of change. They are also typical representations of a

[1] Peters, Charles C., *Objectives and Procedures in Civic Education*, p. 21.

method of thinking that isolates certain cross-sectional moments from a moving and changing whole and then gives them a status of finality and ultimacy.

The process of blueprinting and forging individuals through education promptly reduces education to a state of mechanistic mass production. Education becomes a technique for the realization of technically conceived and strictly prescribed objectives, and is deprived of all means for the reconsideration and re-formulation of aims so inadequately and uncritically derived. And the individual is deprived of all active participation in the educative process which he undergoes, as well as of a self-determination afterwards. And as learners are subjected to a more rigid passivity than was ever demanded by the traditional education, the whole process being more " scientifically " and more " efficiently " controlled, individuals are more efficiently " forged " than was possible by less adequate methods.

This viewpoint introduces forcibly two ideas, not at all acceptable to the prevailing progressive theories of today. One of these is that education is a technique and nothing but a technique, for some ulterior purposes beyond its own immediate value. As these purposes are formed from a vocational point of view, education is regarded as a training for ready-made and predetermined patterns of a narrowly-conceived vocational efficiency.

The other idea is that whatever ideals, attitudes, ways of judgment, and skills we now possess have emerged from conditions of social and industrial organization without any creative effort on the part of the individual or on the part of conscious education. The coming individual is to be forged according to the modes of thinking and feeling existing now; he apparently has nothing to contribute to the further becoming of such ideals and attitudes. The individual is passive, like a machine, in the sense that he is expected to perform exactly what the blueprints called for and what he has been made for.

Ideas implying the unchangeability and passivity of the individual have often been expressed, and the conception

of educational engineering in a scientific fashion both creates and reinforces them. Constant technological changes are easily admitted, but the human being is pictured as passively carried on by that stream of technical change. Thus Ray Lyman Wilbur, Secretary of the Interior of the United States, in talking of the swift changes in our environment today, said: "There is, however, one unit that is being carried forward on that stream that has comparatively little chance for change. That unit is the human being."[1]

The whole structure of such education points backwards rather than forwards. It serves for static preservation rather than for the dynamic reconstruction of human experience. It is limiting rather than liberating, as it conceives of its aims and objectives as restricting boundaries both for the growth of the individual and the development of society. It suffers a two-fold limitation. In the first place, its process is moulded with the purpose of serving strictly predetermined and narrowly conceived aims and objectives, derived from without education itself. This fact carries with it two important consequences: (1) the combination of the specifically determined objectives treated in isolation and of the rigidly mechanical process of education deprives education of its constructive and creative role, which is equivalent to depriving it of its educative power; (2) because education is forced to do subservience to aims derived from without its own process, it is unable to effect a continuous reconstruction from within. Such reconstruction can be effected only from without, and, as it usually is a matter demanding the highly complicated technique of the research specialist, it can be effected only periodically and jerkily.

In the second place, the individual subjected to such education is strictly and passively moulded. Even if the patterns of this moulding were the best possible obtainable

[1] Address before the National Education Association Convention, Atlantic City, 1930, reported in *Educational Record*, Vol. VII, April, 1930.

at present, such an individual, by the very fact that his experience is deprived of a possibility of self-reconstruction is not in a position to enter life as a constructive agent. To the extent that learning is confined to the mastery of specific and isolated elements of experience and of fixed patterns of conduct, it is incapable of dealing constructively with the larger issues of experience, which after all are the dominating ones in governing conduct. The experience resulting from such a type of learning is necessarily technical, static, and cannot result in creative learning.

The unfortunate yet unavoidable consequence that this situation provokes is the eventual sterility and stagnation of those very aims and values which this education is serving, seeing that they are deprived of the critical and conscious reconsideration that in our society, apparently, only education can effect.

Thus, from the social as well as the individual standpoint, the so-called scientific education is devoted to the preservation and stabilization of the existing patterns of conduct and is impotent as far as the constructive guidance of life and human experience is concerned.

Present-day civilization and society are generally conceived to be highly dynamic. Education that seeks to lead progress, or that even endeavours to keep up with progress, also has to be dynamic in its spirit and method. Its adaptation to the current of life cannot be of periodical and temporary nature; it must be continuous. Moreover, in order to direct progress, education should not only adapt itself to survival values, but it should also anticipate the direction of development and create new values. Consequently, education must incorporate whatever is held valuable in the light of what might be possible. It has to guide without limiting; it cannot prescribe because prescription means restricting the potentialities.

Education is fundamentally an evolving process. It is, moreover, an organic process in the sense that it is cumulatively growing, that it is rooted in the past and is pointing toward the future. Whatever aims we are able

to furnish at any stage of that process cannot be considered as final; nor can they be arbitrarily *inserted* into the subsequent educational process. They are evolving, rather than pre-existing. They are evolving qualities of the direction of the educative process, not of some specific phases of it, or anything outside of it. Their value to the educational process lies in their challenging nature, not in their end-state. Development, liberation, the release of energy and thought are the major emphasis of dynamic education, and these cannot be achieved by conceiving ends or aims in terms of detailed final outcomes externally introduced. We cannot foresee or predetermine all the specific patterns that development may take. If we attempt to do this, we necessarily limit future possibilities in terms of present actualities.

III

It would be venturesome for a discussion of a limited nature like the present one to suggest any definite manner of formulating aims or establishing the basic values of dynamic education. But one fundamental principle can be offered, namely, that whatever values there are in dynamic education are process values; they are values of method and potentialities, not values of accomplishment or static end-results; and, furthermore, that these values have to be realized in the process of education itself, and cannot be inserted from outside.

Such process values or ends must necessarily be continuous with the process itself and with whatever is incorporated in the process. Thus the question of dynamic educational aims is not that of formulating aims and then inserting them in the educational process but of giving education such a form that it is able to serve as a means for significant experiences and through these to develop aims from within. As Dewey has pointed out:

> " In our search for aims in education, we are not concerned with finding an end outside of the educative process to which education is subordinate. Our whole conception forbids

this. We are rather concerned with the contrast which exists when aims belong within the process in which they operate and when they are set up from without."[1]

As education is a continuously growing process, one can not, without artificially limiting it, catch any one cross-sectional moment of it, or any outcome of that process at a particular stage of its development, and hold it as a final aim for the subsequent continuity of the same process. Ends, means, and activities belong to the same interdependent unit of action and the reorganization of one depends on and affects that of the others. Consequently the aims which are not formulated in terms of education itself remain sterile to the extent that they are alien to it. On the other hand, the actual (or objective) aims of necessity transcend those which are formally predetermined, if the conditions under which the education is actualized are not artificially limited.

It is not in any sense necessary to hold to predetermined aims in order to achieve a conscious and consistent scheme of educational activities. What is necessary is intelligent judgment and conscious criticism on the spot, taking into account the developments just preceding the situation requiring adjustment and the possible consequences of the direction of adjustment itself. Educational directives, in order to be effective, have to grow out of and change with the process. Therefore the problem of evolving valid and worthwhile aims in education is not that of formulating fixed ideals to work for. It is one of creating conditions rich in media and materials for significant and educative experiences, from which further aims may outgrow. Educational aims remain impotent and ineffective as guiding forces so long as the educational process itself is so patterned as to be sterile and devoid of significant and creatively constructive experiences.

This should by no means be interpreted as a proposal to abandon all thoughts of direction and to complacently watch what haphazard practices will bring out. It means

[1] Dewey, John, *Democracy and Education*, p. 115.

only that education should not be fettered to the results of present thought and practices—for that is what predetermined aims are at their best—but that the possibilities of further reconstruction in education by education itself should be made possible and that this reconstruction should include that of aims and directions.

In this constant re-direction of education through its own process, the problem of the method of dealing with the factors involved in, and determining the educational procedure, is a very important one. Educational processes are many, and of varied type and content. The same is true of aims. There can be no *one* educational aim, however general and inclusive it may be. The variety of educational activities is productive of a multitude of aims, and one is justified in referring to *an* educational aim only to the extent that one views it as a general direction, or as a unifying outlook and a methodological basis of criticism. Educational aims may range from the most specific, such as the fostering of a certain habit or skill demanded by our society of today, to the most general, such as efficient citizenship, self-realization of personality, effective sharing in life, depending on which particular process or particular body of processes of the total educational activity is singled out. The theoretical problem, in facing a multitude of aims, is not that of subordinating all specific aims to one single all-unifying one, or of denying specific aims their right of functioning, but of weighing one aim against another, and of seeing every single one in the light of all the rest.

Neither an all-identifying unity comprised by a single aim, nor a chaotic plurality or aggregation of aims, will serve the purpose of guidance. What is demanded is a central and fundamental group of principles, a unifying methodological outlook, in the light of which the multiplicity of divergent aims can be weighed and re-modified so as to form a consistent and unified body.

So far, methods used to find and determine educational aims have chosen one or the other of the above mentioned alternatives; that is, they have selected an all-identifying

unity in the nature of a single aim, or they have followed an unorganized aggregate of aims.

In the past, it is speculative philosophy that has served most frequently as a medium by which educational aims were set up. By means of abstract thought, certain ultimate, absolute ideals were found, and these were then used as the directives of educational practice. Aims thus derived had the advantage of being clear cut and simple, and of rendering education an apparent and coherent standard to go by. They seemed free of the conflicts and perplexities that ensnare educational thought as soon as it attempts to get too near to the tasks and problems of actual life. However, this clarity and single-mindedness was usually achieved at the price of an abstract aloofness and a barrenness in the actual contributions of education to life and to the specific guidance of those educated. The speculative aims were too much concerned with the abstract to help educational practice or to deal with the immediate needs and problems either of education itself or of life.

Today education has swung to the opposite extreme. In its antagonism towards sterile abstraction it has endeavoured to set aside all "philosophy" and has proceeded to catalogue all "actual values" of life. The "scientific education" is a specific example of such a trend, though in general this attitude is shared also by other types of educational theory.

The assumption underlying such trends is that it is possible, so to speak, to make a complete photograph of life by tabulating its every single item in separation, which means that life is conceived of as a summation of all its specific constituent elements.

That such a photograph is far from possible, has been shown in a preceding chapter (Chap. III). On the other hand, even if it were possible to list all the more or less important values, a list of this type, when translated into educational objectives, would fail to give education the guidance it needs because it would be forced to face life *en masse*, no means for discriminating choice being

provided. Such an uncritical approach to the values of life, and consequently to the values and aims of education lacks the central basis for evaluating and organizing principles of thought, without which it is impossible to attain an articulated and integrated view of what life is, what it demands, and what education should aspire to.[1]

As a directive for educational efforts such a cross-sectional photograph of all activities of adult society is of little worth because it is able to present only an incoherent aggregate of a multitude of values, without any basis for choice among them or for their evaluation, putting education completely at the mercy of unorganized details. Furthermore, like all atomistic analyses this photograph of values and objectives fails to discover those aspects of life and its needs, which are not the direct properties of the specific elements of experience. Generalizing ideas, organizing concepts, trends of thought, evaluations and other supra-local elements, are integral parts of life and therefore important for its understanding. Moreover, from the standpoint of the conscious guidance of life or of individual experience these are the basic things, because they are dominating forces among those governing intelligent human conduct.

It is well at all stages of the analysis of educational aims to bear in mind the actual demands of life, and the actual activities of mankind[2] yet it is a mistaken idea to think that a review of these activities as an aggregate will furnish a complete understanding of actual life, or to believe that their compilation will provide a chart which will be sufficient to guide learners in a preparation for the tasks of participating in adult life.

Neither generalities too abstract and too remote to have any important significance in actuality, nor concrete and specific objectives devoid of any unifying generalizations and principles, can serve as an adequate basis for the guidance of education. Education in order to be a

[1] Bode, *Modern Theories of Education*
Bruce, "Whither Secondary Education? —
tion and Supervision, 1929, Vol. XV, p. 341.

[2] Bobbitt, *How to make a Curriculum*, p. 9.

constructive factor in human experience, has to be borne by concrete and actual situations, in which the specific can be seen in the light of general principles, in which the details and concrete elements are organized by means of concepts and logical relations. And, consequently, its aims are to be formulated so that they integrate the concrete actuality with the general principles, guiding ideas, and concepts.

What, then, should be the method of analysis designed to be the basis for the formulation of directives for a dynamic education ?

The learning process specifically, and educative experiences in general, are relational processes, with the individual at the one end of the relation and the objective values of the environment—physical, cultural, social, all subject matter of learning and experience—at the other end of the relation. Learning is what happens between these two poles of the relationship, and what emerges from this " happening between the two." The problem of education is to provide conditions where the values immanent in both poles of the relation can be preserved and at the same time re-created. The immanent values of individual experience are not to be sacrificed for the sake of preserving the structure of objective[1] subject matter, nor should the needs and interests of the learners be allowed to do violence to the structure of objective-values and the logic of race experience, of tested knowledge, and of the social life. In other words, to be significant and promise a fuller and better life, education must be of a nature which allows a fuller realization of both the individual and of the objective values, of the objective content of experience. Social heritage as well as individual experiences must be enhanced through education. These are the two integral parts of the educative process, both as to participants and as to the potential outcomes.

[1] The term objective as used here does not indicate an epistemological status as to reality, truth and validity. It is used to describe such subject matters of experience which exert a compelling influence on the resulting experience.

The analysis of either of the two poles of the relation in separation is inadequate for the setting up of aims for a process in which they are inter-related. To formulate these aims satisfactorily, it is necessary to see the growing individual in a relation to the objective values of his environment.

Consequently, the starting point of the analysis for the formulation of the aims for education should be where the values inherent in both poles of that process are to be found in their integrated unity and inter-relation, that is, in the educative experience itself, this to be followed by the evaluation of the specific materials, problems, contents, and values during the process of education on the basis of principles found in the preliminary analysis.

At present the analysis of the values of the social heritage and of the social life of today is made without regard to their relation to the developing experience of the individual. The result is that the values immanent in the cultural heritage, in race experience as inherited and already formulated, have so decided a predominance that the process of formulating educational aims has taken the reverse direction. The present tendency is first to ransack the existing forms of cultural inheritance, whether in the nature of systems of knowledge or in current practices of thought, behaviour, and attitudes, in order to find what they may contain as to aims and values. They are then re-formulated so as to fit the psychology of the learner and the structure of the process of learning. Thus, though the demands of a dynamic society as well as those of the individual may be quite definitely borne in mind, the method of the actual analysis of educational values is such as to favour the static values of the social heritage and incidentally those of various subject matters.[1]

The consequence of such a method is that while a pretence is made to reconstruct educational aims and values in terms of a developing society and of the

[1] Hopkins, L. Thomas, *Principles and Methods of Curriculum Construction.*

individual and his needs, it is the values inherent in different formulated "subject matters" that are of predominant influence in the formulation of the actual aims.

Major educational aims cannot be formulated by aggregating the specific aims of various subject matters. They need to be constructed from the guiding principles evolved in the analysis of experience as an educative process, having its individual quality, and carrying its social and moral implications within itself. To start with the analysis of the values of subject matters means to subordinate the values and aims evolving in the experience of the learner to those of subject matter. It is too easy to accept the values implicit in existing subject matters without seeing them concretely in terms of their significance to living and evolving experience.

It is quite generally accepted that it is impossible to find and formulate educational aims either on the basis of the analysis of the social heritage only or on the basis of the analysis of the needs of the development of the individual only. Unfortunately the tendency to separate these two inseparable agents in education is so deep-rooted that the problem has been viewed as a conflict between the needs and interests of the child and the demands of the objective social and cultural values. In other words, the problem of educational aims is set up in terms of a conflict between the immanently valuable, and therefore educative, experience of the learner on the one hand, and, on the other, the continuation of the cultural heritage, the preservation of social institutions and values, and the preparation for participation in future adult society. The solution to this impossible question is then sought in the correlation of the customary curriculum materials with the needs and interests of growing individuals, and the necessity of such a correlation is stressed with almost equal insistence by the advocates of the subject matter type of curriculum, by the proponents of the "scientific education," and by some, at least, of the sponsors of a creative, active, and integrated educative experience.

The method thus employed is that of viewing separately what organically belongs together, and then attempting to combine the outcomes of the two analyses.

This serves to create a number of artificial problems. How, for instance, can the values found in an analysis of adult society today be so incorporated into the educative materials that the experience of those educated will not be unnecessarily limited? Not, surely, by translating the attitudes, activities, and beliefs of adult society into some form which is psychologically acceptable to the learners. In the resulting compromise the objective subject matter which such a method is trying to preserve, as well as the experience of the educands, will lose much of its genuineness, and consequently much of its value.

The substitution of unifying principles, such as leading concepts, guiding meanings and generalization on the part of social analysis, for aggregates of isolated activities is an important improvement in the search for aims in education, but in either case the approach in general remains the same, namely, a segregating of the integral parts of the same process and a viewing of them apart from each other and from the process of experiencing. The only adequate approach must of necessity be through analysis of the educative experience while it is in active occurrence—that is, while the learner is in actual contact with those objective materials and social values.

This emphasis on the need of evolving educational aims from education itself should by no means minimize the worth of a keen and thorough analysis of the objective values of the cultural and social heritage. It is very important to note that a genuine insight into the values and methods of thought as well as into the factual material of the bodies of tested thought, and an understanding of the attitudes, ideas, generalizations and beliefs governing social life today, are essential factors for the successful conduct of education. They guide us in setting up the educative environment, they help us in forming the educational programme, they also help to evaluate the

learning process. An educational process, in order to be rich enough to result in varied, critical, sensitive and understanding experience, has to utilize not only facts and information, but also the generalizations and leading concepts under which these facts and this information are systematized and grouped, and under which social life at present actualizes itself. School life, in order to be truly educative, must include such generalizations and concepts in the materials with which the educative environment is built.

But it is misleading to believe that such generalizations and key concepts, apart from their effects in the educative process, will provide actual aims, serviceable to a dynamic and integrative education. The only service they can render is to figure as materials, as tools, as media through which the educative experience and its aims are evolved.

The major aims and guiding concepts of our present society cannot be taken over as educational aims because they belong to a different unit of activity, to a different set of experiences, and therefore are external to education. The educative process has its own individual unity and quality, and aims external to that process cannot be transferred over without distorting the unity and fruitfulness of the process. The task of education is to integrate these generalizations and concepts into its own system, and then, with the help of such integration, evolve its own aims.

Moreover, it must not be forgotten that the purpose of education is to help the growing generation to live their own lives in a better way, and that this can be achieved only by putting all that we think good and helpful at their disposal, that they may make it an integral part of their experiences. Whatever values, concepts, ideals, and beliefs now govern and direct our lives can at the best only be material for the new generation to use in developing its own concepts, ideals, beliefs and other directives of conduct. The resulting directives may be similar to those contained in materials used for learning, they may be considerably different, but they will be, and must be,

a part and parcel of the learners' own efforts to create the means for conducting their lives.

The point can be illustrated by a consideration of "democracy" as an aim or guide. Democracy is not a formalism, it is a way of living together. We can find very important hints for education in analysing the democratic ways of living together as found in our present society. But democracy as an actual aim for the learning group in school can be evolved only in their own ways of democratic living together. We have to furnish children with an opportunity to cultivate their ways of democratic living together; more important, we must not close, by imposing the forms and concepts and attitudes of present day democracy on them, the possibilities for the evolving of their own ways of democratic living together. We should always hold any form of present social life and thought, any form of civilization, not as a mere fact but as a challenge for further progress. Ideals are being wrought all the time. They are wrought in schools as well as in life. They are wrought by adults as well as by children; and as to future possibilities, those of the latter are, after all, more important. For the sake of continuity, integrity, consistency and the development of all potential powers, the aims of education should be found in these becoming forms of living, in learning in its true sense.

The reason, of course, why actual learning experience is not trusted as a reliable basis for the finding and forming of educational aims, is the fear of losing the solidarity of experience. We are accustomed to regard the experience of children in school as a fragmentary, partial experience, and therefore incapable of self-creating coherence. Consequently, it is felt that the contents of the learning experience have to be framed and outlined beforehand, either as the systems of knowledge selected for the purpose or as a list of scientific aims to be achieved. Experience, however, is interactive. Any point of it, with intelligent guidance, will lead to others. The fundamental relations, fundamental concepts, when

adopted as leads, will guide experience into all the fields that are necessary for its coherence. The limitations that educative experience has suffered so far are not conditioned by the lack of leads and pointings in experience itself, but are the result of limiting forms in its guidance.

A consistent following of this point of view would bring us to the question of the role of pupils in the forming of educational aims. If aims are formed not in thinking apart from acting, if they evolve from the process of acting, then the role of those participating in that acting cannot be overlooked. In a consistently active educative process every effort should be made to develop in the learners the power of critically judging the growth of their own experience in terms of the goals in view, and of grasping and understanding the major leading aims towards which their experience is leading them. They should be able to anticipate future leads and the direction of their experience, in so far as this is possible, and to direct their own growth accordingly. There have been changes in that traditional condition where those who guided the educational process—curriculum experts, philosophers—assumed the thinking for the learners and reserved the understanding of educational aims as their own exclusive privilege. There have been changes, too, in that the aims of education are now formulated in much closer correlation with the actual school situation than used to be customary. Nevertheless, we still find in educational practice far too little concern over the actualizing of certain general aims in every detail of school work, and the bringing of every detail of school work to bear on the creation of aims and objectives. Often learners are not even aware of the ultimate direction towards which their growth and learning is directed, let alone are given an opportunity for intelligent participation in creating and realizing such aims. Education in Soviet Russia has included in its principles of method the demand that the learners be aware of the ultimate aims of the educative process in which they are participating. Yet a truly experimental philosophy has to demand of its education not only

awareness of the ultimate aims, but also an intelligent *participation* in the construction of such aims.

The precise forms such a principle would take in its practical applications are hard to foretell and scarcely within the limits of this study. It is a matter, however, which should receive serious attention from educators today, if educational practice is to achieve the integration of general directives and concrete processes.

Aims, in order to render significant direction to the educative experiences, have to become alive in every concrete detail of that experience. And because of the becoming nature of the educative experience, this principle in its turn requires that the aims and directives be evolved and re-formulated with every new development in the process of that experience. The educative experience, therefore, can be truly genuine to those undergoing it only to the extent that they consciously participate in creating and applying its directives. And values which are not an integral part of the educative process, that is, which do not evolve from the experience of those educated, remain external and ineffective, however closely related they may seem to their interests.

Chapter VII

CURRICULUM THINKING

I

With the change in the conception of the role and aims of education as discussed in the preceding chapter, the problems involved in the selection and organization of educative experiences and their subject matter have to be seen in a new light. These problems are customarily relegated to the domain of curriculum making, or curriculum construction.

As the terms " curriculum " and " curriculum making " or " construction " convey many conceptions which are not acceptable to the point of view advanced in this discussion, the term " curriculum thinking " has been adopted here to indicate a general domain of thought and problems without conveying the ideas and positions customarily held regarding the curriculum, its form, and its role in education.

The task of education, as understood at present, is to lead growing individuals to more and more intelligent, wide, well-organized, and rich forms of experience through guidance, through selection of subject matter, and by providing an environment which is stimulating to self-direction. The central question, then, is—where should that guidance come from, and in what terms shall it function, so that it shall be instrumental to a liberation of the powers, abilities and potentialities of the learners, so that it shall lead them into channels of activity and thought which are socially and culturally productive and individually satisfying, and at the same time preserve the continuity of the total human culture and thought ?

Translated into technical language the question becomes —what should be the method of curriculum thinking in education that aims at the continuous reconstruction of individual and social experience ?

To assist us in finding an answer to this question, an analysis of the main characteristics of the elements of the educative experience may prove useful.

It has already been brought out repeatedly that the process of experience is a relational one, and that its determining factors, as well as its results, lie in two directions: (1) in the direction of the material and subject matter of experience, and (2) in the direction of the processes, motives and means of experiencing itself. For a full development of experience rich, varied materials and a challenging environment are essential. But equally essential are the sensitivity, the inquiring mood, the organizing and integrating capacity, the mastery of essential tools for intelligent experience, and capacity for organized action and thought on the part of the individual.

Both these groups of factors are closely related and interdependent in the sense that one cannot be widened, enriched and developed without a widening, enrichment and development on the part of the other. The objective values, knowledge and stimulating environment, are ineffective to the extent that the individual lacks powers and capacities to live with and through them, to make use of them, and to incorporate them into his experience. On the other hand, all potentialities of individuals remain sterile when they do not have sufficient challenging materials to work on, when they lack means for expression, when they lack stimulation for activity and development.

Both of these factors of educational experience reconstruct each other mutually and progressively. The development of the means and methods of experiencing effects changes in the environment and those changes in their turn reconstruct the ways of experiencing through new stimulation.

The range of materials from which the developing experience may draw is wide and of varying quality. Among the totality of the subject matter of experience, systematized and accumulated knowledge plays an important role. In the crystallized race experience we

find the raw materials of our environment already organized, already reconstructed into usable methods of thought, inter-related ideas and systematized bodies of facts. The tools of expression and means for inquiry have been worked out. A vast body of data is unified and simplified, so that it offers ready materials, elaborated tools, and means for knowledge, for understanding, appreciations and action. But in addition, this organized race experience, through all its forms of expression (books, ideas, related facts, institutions, generalized concepts, established forms of social living and thinking), provides means for widening the scope of direct experience, which if limited to the possibilities of immediate contacts with the living environment would of necessity be incomplete.

However, an equally important source for learning is provided by contact with the living environment of today, both social and physical. The conduct of learners is greatly affected by their contacts with the immediate environment. Facts, ideas, opinions are acquired in the process of direct living. Patterns of conduct are determined by surrounding conditions. The individual's character is moulded through communication with other people. Directions of action and modes of appreciation are determined by the immediate activities in which every normal human being participates. And, finally, the productivity of experiencing itself leaves deposits in the form of formulated truths and ideas, patterns of feeling, thought and conduct, generalizations, attitudes and appreciations.

This reciprocal interdependence and mutuality in development is not limited to that existing between the functional and contentual aspects of learning experience. Learning is always multiple in its effects ; no one learning experience is of local effect. Through occupation with race experience and through direct participation in life within or outside the school, the individual's experience is moulded in all its aspects. The effects of any one act of learning transcend the total structure of experience.

Education, as its role is conceived today, must deal with an all-round development of the individual. And consequently, the conscious guidance of educative situations must deal equally effectively with all factors which in any way affect that development. And, secondly, it must deal with them from the standpoint of developing experience and in connection with that experience.

The first of these statements has been reiterated so often that it sounds almost trivial. The idea that the conscious guidance of education must consider the all-round development of the individual has been an item of the educationist's credo since Herbart. But the term "all-round" has been understood chiefly in an intellectual sense, and up to the present it is intellectual activities that have been monopolizing the programme of a supposedly "all-round" development.

As in the scheme of conscious guidance and planning of education, tradition has favoured but one group of factors instrumental to learning, namely, academic subject matter, so curricula have represented mainly an outline of that subject matter, and as much of the treatment of the learner and the consideration of the wider consequences of his learning processes as seemed necessary for the mastery of that subject matter.

Education promoted on such a basis is doubly narrow. In the first place, out of the totality of factors influencing experience only the contentual side is made educative, is consciously selected, and is planned for educational purposes. And, secondly, within the range of all the subject matter of experience, intellectual academic learning is selected as the sole object for conscious planning.

As the intellectual functions form but a fragment of the total experiential functions, and as academic subject matter is but a small part of the total subject matter of experience, education for intellectual culture alone is only able to take care of the partial development of the individual.

This one-sidedness of education as to subject matter has been largely corrected today. Strictly intellectual culture has yielded to subjects of more immediate interests and utility. The practical sciences and the fine and practical arts have been given their place among the more academic subjects.

But the same cannot be said of the functional side of experience. Habit formation, the development of attitudes and appreciations, of means of self-directed, and critically and wisely conducted action, of ways of co-operative living, of social patterns of conduct, and a whole multitude of problems of character education, though receiving some attention on the part of curriculum makers, are not planned for as fully, guided as consciously, and directed as scientifically, as is the instruction in subjects. As a result, their development through education has been less adequate, more uncritical and haphazard. These phases of education have not yet received the attention that their importance as determinants of experience would warrant. Scores of activities that are sincerely thought of as invaluable in character education, for widening of interests, for developing self-reliant and independent methods of dealing with problems of actual life, have not yet found their true place in the scheme of formal education.

This situation is expressed clearly in the organization of school procedure today, where most of these educational experiences are relegated to the extra-curricular activities, a division in the total school curriculum which is one of the outstanding paradoxes of our contemporary education.

The true significance of this division, however, does not lie in its indication of the place that the various educative activities have in the daily programme of the school, important as this is. It is to be found in the fact that the activities considered as extra-curricular do not receive the full thought in the matters of planning, actual guidance, and estimation of the outcomes, that the activities and subjects included in the formal curriculum enjoy. The

result of this practice is that while educators today definitely know what to teach in arithmetic and other subjects, how to do it, and how to evaluate the results of their teaching in these fields, they possess far less definite knowledge as to what values and what possibilities lie in these informal activities, and how to make them educative to the utmost, even though in general the educative value of these latter activities may not be regarded as inferior to that derived from occupation with the school subjects.

II

Education that seeks a continuous reconstruction of the total social and individual experience through self-directed activities cannot rest content with a development of the individual which treats as incidental the activities and phases of learning that are paramount in building and directing experience in its wider and non-academic sense. It not only has to emphasize those phases of learning which are not directly connected with the mastery of academic subject matter, but it is compelled to go beyond this, and subordinate the whole process of educational practice (including its subject matter) to the demands and needs of developing experience. In other words, the liberation of the powers and capacities for a rich, wide, well-integrated experience, the growth of interests and of motivation for further learning and of methods of inquiry and good reasoning, should be the determining standards for the organization of the educational processes and its materials.

This means that the form and sequence of educative activities should be determined by their effects on the growing individual, and that subject matter should be selected and organized to serve as an adequate means for the cumulative, consistent, and continuous growth of this experience.

The hitherto dominant methods of curriculum construction have paid little heed to this demand. Like

educational aims, so also the sequences of educational experiences and the selection of subject matter is effected not on the basis of what is essential for the development of educands, but what follows the logic of external and objective values—and the growth of experience is subordinated to those values. In this respect the logic of the sciences represented by the academic subject matter and the demands of adult life furnish the most widely applied standards. What to teach, in which way to do it, how to organize and relate facts and ideas, how to interpret phenomena, and in which channels to lead the awakening intelligence and thought—all these problems are solved not on the basis of what is most fertile in the way of self-directed, well-organized, and wide as well as qualitatively diversified and rich experience, but what best preserves the values, the logic, and the method of thought of the formulated knowledge and accepted moral and social institutions, and best transmits the ideology of the research specialists in their respective fields. Or else the practical demands of adult life are given the deciding role in the selections of educative subject matter and in the organization of educational activities.

In both these cases the integrity, fruitfulness and self-direction of developing experience from within are sacrificed to some ulterior purpose, are subordinated to the externally derived values, and a superimposed logic of organization governs the process and content of education.

The conflict of policies regarding the central principles of the organization of educational processes and content is a comparatively old one. The discussion of it has taken the form of a conflict between the psychological and the logical organization of the subject matter of instruction.

The general position of those standing for the priority of the logic of the subject matter as a basis for the organization of educative materials, as against the proponents of the so-called psychological organization, is that there are binding principles of thought, leading ideas, and compelling generalizing concepts in the bulk of our

formulated race experience which are absolutely necessary for a consistent and intelligent way of looking at the phenomena of life. If these fundamentals of race experience are neglected, the developing experience, it is claimed, inevitably becomes futile, fragmentary, incidental, lacks an organizing centre of outlook, and is not able to grasp the fundamental relations, the fundamental principles of thought and inquiry, is poor in content, powerless in its functions, and subjective.

The assumption underlying such a position is that the experience of the layman, when allowed to take a normal course of development, is not able to achieve a closely-knit network of interpretations, that it is not capable of seeing the logic of facts, events and ideas, and that it is not capable of intellectual organization and of intelligent re-adjustment in meeting problems. It is supposed that if education were to abandon the logic of the systems created by the different sciences, the resulting experience would be chaotic, unorganized, incompetent and blind.

To a certain extent this position is a correct one, especially when viewed in the light of the present prevailing attempts toward the psychological organization of the educational process and its subject matter. The present practices of using the individual as an educative unit, around which and according to the demands of which the educational process is to be organized, are frequently based on a narrow and one-sided conception of that individual, who is conceived only as a psychological phenomenon, with subjective drives, interests and motives for action, and with definite, and to a certain degree fixed patterns of conduct. The individual is viewed apart from his relation to the objective world of facts, ideas, concepts, and so the latter's structure is seen independently from the effects that that relation would or could have on the structure of his experience. As the interests and trends of activity of the individual do not carry within themselves the patterns for their growth and development the organization of education around the individual conceived in such terms leads to the

incidental, fragmentary, one-sided and narrow development of experience. Education in such terms is apt either to neglect or to deform the fundamental logic of ideas, events, the inherent relations between facts, points of view and interpretations. It is also likely to fail to understand and follow the logic of the objective world around us. The organization of education in such terms is certain to lead to the disintegration of race experience into fragmentary, incidental, and unrelated knowledge, interpretations, and outlooks.

But this position is based on the erroneous supposition that the logic of the objective world and ideas is identical with the logic of distinct isolated sciences, organized around specific principles of thought and dealing with specific groups of facts. It is also a mistake to suppose that the logic of the research specialist is the natural logic for every type of experience, and that the unity of segregated fields of knowledge *eo ipso*, when followed and mastered, assures the unity of total experience. It fails to draw a definite distinction between the logic of subject matter, as specialized and scientifically organized bodies of knowledge, and the general logic of fundamental relations, sequences, and implications of the facts, meanings, concepts and events. The former is the logic and organization of the scientist within his own field; the latter is a logic from the standpoint of intelligent experience, not limiting itself to any specific field, but seeking relationships within the totality of experiential material. The former would be a coherence of settled and systematized deposits of all experience, the latter that of experiencing; the former is specialized, the latter general.

By "logical" organization, in fact, is usually meant an acceptance of a ready frame of subject matter as stated by the specialist in the field. Thus a collection of algebraic laws and principles under one school subject would be a "logical" organization of school experience, whereas the following of the "function" idea, starting with experiences familiar to the learner and probably

ending in most of the abstract mathematical functions, would be considered as a psychological organization, which is supposed to neglect the logic of the subject matter.

However, the organization of knowledge through specialized sciences is not the only organization which is in keeping with the demands of the consistent intellectual interpretation of facts and with those of scientific thinking and inquiry. The organization of knowledge in closed and separated fields of science has no monopoly either of scientific thinking or of scientific treatment of phenomena. The lay experience can develop its own logic, if by that logic is meant (as usually is the case) the appreciation and understanding of basic inter-relationships of the fundamental interdependencies of facts, events, and ideas, and the exercise of sound and consistent reasoning in the making of judgments and the drawing of generalizations. While the product of lay experience cannot be called science, this experience can surely be said to employ scientific and accurate as well as adequate reasoning in dealing with the materials and problems of its immediate concern.

Moreover, a mere mastery of a logically-organized subject matter is far from guaranteeing scientific and logical reasoning on the part of those who achieve that mastery. And in so far as this is true, the principles, concepts and ideas expounded by systems of knowledge, or by school subjects based on such systems of knowledge remain but empty symbols in the minds of learners. In fact, the thought processes, the interpretations, and the generalizations implicit in school subjects must appear most illogical to the learners in that they do not become tools for their own reasoning. For in order that ideas may be logical, their logic must be wrought out of concrete and direct experience. The inter-relations of facts and ideas become really clear only when they are seen in connection with vital experiences. Principles of thought acquire a real significance only when the learners discover them, after they themselves have fought their way through the

entanglement of familiar experiences to the clarity of fundamental principles involved.

Consequently, the teaching of logically-organized subject matter does not of necessity result in a logical treatment by the learner of familiar phenomena, just as the teaching of sciences will not achieve scientific reasoning on his part. And as the aim of education in its initial steps is to educate, and not to train specialists, the logical organization of subject matter, as it is understood today, does not accomplish what it is intended to do. Indeed, the exact opposite is usually achieved, for when scientific systems in their entirety, and their segregating isolation from each other, are imposed on developing minds, such education is in danger of effecting precisely what the protagonists of logical organization are warning against, namely, the disintegration and atomization of experience.

The abandonment of an organization of educational materials in the form of subjects centred around the logic and principles of the research specialist does not necessarily imply an indifference to the logic of facts, of ideas, of fundamental relations and concepts, for it is not necessary to plod through the whole extent and sequence of the subject matter of certain disciplines in order to grasp those essentials which they hold and which are the fundamental and necessary basis for intelligent experiencing of any type. These fundamental principles are few, while their applications are many and varied, and it surely cannot be deemed necessary to master their applications in their entirety in order to understand or appreciate the principles, or in order to be able to incorporate them in our ways of thinking.

Every subject in our present curricula is supposed to introduce the learner to distinct methods of thought, to distinct groups of principles, and to distinct ways of interpreting facts and events. As a statement of the major aims to be secured in thought processes by the totality of the curriculum materials, the following tabulation would probably be acceptable to most educators:

"The learner should have active contact with (1) our racial inheritance as expressed in literature, history, customs, institutions, etc.; (2) the scientific method of making phenomena intelligible; (3) the mathematical way of looking at the world; (4) the historical outlook upon man's development and achievement in building conceptions of a world of changes and developments; (5) the method and manner of expressing in other tongues what men have thought, felt and done; (6) the artistic categories for the creation and expression of meaning in objective terms; (7) the work day performance of brain-guided hands, i.e. the constructive arts and a looping up with industry by forming friendly alliances with farmer, banker, merchant, manufacturer, etc."[1]

The different groups of subject matter that would ordinarily be utilized in order to achieve the above aims are quite apparent, and the usual practice in educational planning is to parallel such a list of aims with the list of subject matters expected to attain them. What is usually neglected, however, is the fact that while, as we have already suggested, every subject exhibits and includes some specific principles of thought and fundamental concepts, their applications are many and are not limited to any one specific subject. In fact, many subjects taught as segregated fields have the same organizational elements in common. Moreover, as the above aims are aims to be realized in the process of experiencing, it is imperative that they should be approached through the specific applications which are most significant and most adapted to the structure of the particular experience that is to achieve them, and not from the point of view of the structure of the subject matter through which they are to be realized.

If it is borne in mind that the major principles behind the concrete subject matters and concrete activities are few, while the specific applications of these principles are many and varied, and if it is accepted that the best educational procedure in order to achieve certain aims is

[1] Miller, H. L., and Hargreaves, R. T., *The Self-Directed School*, p. 144.

to select the applications of the principles that are of significance to the learner because of their pertinency to the experience in process, it will be seen that it is unnecessary, as well as unwise, for the teaching procedure to keep rigidly within the grouping of the facts and ideas of each distinct subject in science, mathematics, or history, in order to develop a scientific treatment of phenomena, a mathematical way of looking at the world, or a sense of the development of human culture. While the mathematical way of looking at the world is an essential one, its realization does not pre-suppose the necessity of teaching algebra, geometry, and trigonometry as segregated subjects, just as it is unnecessary to follow exactly the thought processes and ideas in these subjects in the sequential connections prescribed by them as scientific disciplines. The only principle to be considered in such a connection is that the more basic and elemental should precede the more complex and advanced. Given this logical basis for organization, the next important thing as a determining or controlling factor in selectivity and organization is the experiential situation, not the organization of the discipline. The selection of the matter to be learned in mathematics, for example, should be based on what is fundamental in the mathematical way of looking at the world, the choice of the concrete applications of those fundamentals depending on the structure and needs of the experiences of the learners. Thus the lines of cleavage between different subject matter would not be sharply drawn, and the subject matter used for achieving this aim would be culled from various fields, depending, on the one hand, on what serves to clarify certain principles and, on the other, on what is most significant to the learners and on what gives them the most genuine experiences.

So while in general it must be acknowledged that education has to take cognizance of the compelling fundamentals in the objective world of knowledge, ideas, and concepts, it must, on the other hand be stressed that in the particular development of these it is not necessary

to adhere to the sequence of subject matter or to the particular manner of organization of ideas and facts in any of the segregated fields of science.

This point of view can be supported with still further considerations. From the educational standpoint it is important that those basic principles or concepts should not only be made parts of the educative experiences, but that they should actually become effective in the experiencing of the learner by aiding the individual's ways of looking at the world, making his reasoning clearer and more consistent, enlightening his interpretations and outlooks, and challenging constructive thought on his part. This position requires that the racial heritage provide the subject matter of learning, or the subject matter of educative experience, in that form and manner in which it can best be integrated by the learners, and actively utilized by them. Neither the departmentalization of learning nor the following of external principles in its organization is fruitful to this end.

Moreover, the motivating power for occupation with subject matter instrumental to learning is lacking when the materials fail to tie up with the continuity of experience.

Continuity of experience rises out of the continuity of activity, interests, and purposes. Through the pursuit of goals and interests are developed the means for inquiry, the sensitivities, the capacities for intelligent reorganization of materials offered by the environment, the methods of re-adaptation of conduct through thought and action. At every step of this process there rises a definite need for information, for knowledge, for helpful ideas. It is in and through such situations that the important subject matters of race inheritance can be made truly significant and productive. But in order to be so, they have to meet the need of the particular situation and of the capacities and powers of the experiencing individual. In other words, the educative subject matter has to be continuous with the development of the experience of the individual, both as to its qualitative content and as to

its level of complexity. The teaching of a certain idea or skill, or of a body of information, has little educative value when it is evolved within a context that has no significance to the learner, or when it is beyond his capacity for understanding or application.

At the same time there need be no fear of the limitation of education by making the learner's capacities the basic criterion for the selection of subject matter for every practical instance of educational procedure. It has been unfortunate that these capacities have been regarded as fixed limitations instead of potential forces. Rather than restrictions, they should be seen as forces that can be expanded, widened, and increased through wisely guided occupations and wisely selected subject matter. The situation viewed from the adult standpoint, has usually been seen as limitation of the curriculum by the limited capacities of the individual, instead of as a limitation of the individual by the narrow, artificial structure and boundaries of the curriculum.

The problem involved here is not that of a limitation of educational achievement by the shortcomings of the individual, but rather that of an adequate procedure by which the capacities of the individual shall be challenged and expanded, and through that expansion arouse the need for higher levels of knowledge and thought. While there is no limit as to how far learning may go and as to what subject matter it may eventually use, it is necessary that at every step of this development the nature of the educative subject matter, the type of its organization, and the sequence of the educative experiences, shall grow out of the needs of the developmental stage achieved by the preceding experience and learning of the persons concerned.

Into the coherence of developing experience the logic of the research specialists, the organization of activities according to the sequences and demands of adult activities, bring an alien note. And thinking in terms of values external to, and disintegrated from, this unity necessarily leads into pitfalls of disorganization and discontinuity.

When the inherent consistency and continuity of experience are replaced by some external continuity, the inevitable result is to prevent the acquired knowledge, materials, data, facts, and ideas from tying up to the stream of activity and thought of the individual. Consequently, a great deal of effort is wasted by mastering facts and ideas that are not needed, or that do not contribute to better thought or to a more intelligent and more critical guidance of conduct. The race heritage instead of becoming a useful tool for living experience becomes a dead weight and useless ballast, with the subsequent patterns of experience unable fully to profit from the preceding experience. The growth of experience is disintegrated, partial, and wasteful. Its organization is not cumulatively clarifying and unifying, as it should be while expanding.

The difficulties created by the adoption of external standards for curriculum construction are not confined to the effects on the experience of learners. Curriculum thinking as a problem of professional educational thought has also suffered. In fact, it has been presented with some problems impossible of solving. For when the range and scope of the curriculum materials are dictated by the objective values of the total deposits of human thought and experience, and by the variety of important fields of activity found in adult society, a constant expansion of curriculum materials is inevitable with the resultant congestion we witness today. Furthermore, when it is believed that an all-round and broad education demands an exhaustive mastery of the important fields in our cultural heritage, it is inevitable that the review type of education is made to take the place of intensive mastery of a few basic principles and their creative application through education. The fields and subject matters which are outstanding in their service to the culture and the forms of living and thinking today are many, and quite beyond the powers of any one person to master. Education, when considering only the value of these fields of knowledge as subjects, is unable to resort to any criteria

that will assist it in striking a balance between the restrictions imposed on formal education by factors such as limitation of time and the capacities of the learners. Viewing and utilizing these fields of knowledge as such only, it is compelled to adopt the policy of continuous expansion at the expense of intensity and thoroughness.

The problem, of course, was not apparent when a few selected fields of knowledge were considered as the satisfactory representatives of certain significant and desirable values. Then, curriculum construction that proceeded on the basis of covering the entire ground of subject matter held to be educationally useful was practicable and capable of rendering a unified and intensive education within the limits of the prevailing expectations. Traditional education did not attempt to cover more than the so-called cultural subjects, and, because of this definite circumscription of the field, was able to be educative as far as such an intensive study of a few important fields of knowledge could be considered educative.

But with the rapid growth of the applied sciences there has come, as we know, a tremendous expansion in the subjects worthy of the schools' attention. The modern world has enlarged its store of interests and its body of knowledge. The fields that represent important values, either from the standpoint of academic learning or from that of their usefulness to later adult life, have multiplied. To the broad stream of knowledge the eighteenth and nineteenth centuries added the natural sciences, and the twentieth century has already added, and still is in the process of adding, more and more forms of applied sciences and technical subjects of vast number. To this burden on education the demand of an industrial age for vocational skills has added its share.

In addition to a formidable increase in its range of subjects, education has undertaken an expansion of its interest in matters such as character education and the fitting of the growing individual to the demands of adult

life. Habit formation, the acquisition of some fundamental vocational skills, education for citizenship, and other similar functions today demand the serious attention of education. But while the tasks of the school have thus multiplied, the principle governing the development of the curriculum has remained inherently unchanged, namely, the expansive addition of the subjects and materials according to the growing needs of society. As every new objective forces a new subject into the school curriculum, an extreme overcrowding has naturally resulted, followed by a disintegration and atomization of old and new fields of knowledge.

As this expansion and specialization forbid a larger educative utilization of fewer materials and fewer fields of activity, the atomistic development of educational enterprises and subject matter is limitless without being really exhaustive. And the effect on the learner of short and superficial contacts with many segregated fields of subject matter and activities is scarcely educative. These contacts result in scattered thought and an impaired integrity of experience.

A clear example of this atomization of educational activities and this striving for exhaustive thoroughness is furnished by the "scientifically-made" curricula. A list of human activities such as proposed by Bobbitt[1] as a chart for training students can be enlarged indefinitely without guaranteeing completeness—without even guaranteeing, as a matter of fact, that the most important activities are included. A curriculum of this type would be extremely bewildering to both the teacher and the student.

Another problem rather intimately connected with externalism in curriculum planning and with the overemphasis on subject matter is that of the limiting effects of such education on the experience of the individual in particular and of the social experience in general.

Neither the social heritage nor the individual with his capacities, interests, and abilities can be regarded as a

[1] Bobbitt, F., *How to Make a Curriculum.*

finished product. The former is not a final achievement, but stands as a challenge to present life and to coming generations. Its institutions, values, truths, opinions, interpretations, generalizations, and points of view are not dead matter but living, in the sense that they are to be re-discovered and re-created in every concrete instance of their applications. And the capacities of the individual can be almost infinitely expanded and intensified when developed under stimulating and challenging conditions.

In this process of reconstruction, the individual plays the role of a power-house, through which the wealth of the accumulated race inheritance is translated into the living forms of experience, and through this process is given new meaning, new forms of expression, and new significance.

Consequently, it is of the utmost importance that the individual should find through education appropriate avenues of self-expression and forms of activity which will expand and develop his constructive and creative capacities. For educational practice this means that the very first contacts of the individual with the racial heritage be such as to challenge creative thinking, that these elements of the racial heritage be seen as something to use in constant constructive activity. And it is equally important that the individual, the learner, be treated in terms of what he may become under favourable conditions of development, in terms of what he may become under adequate guidance and stimulating challenge. Specifically this implies that neither the educational process, nor the subject matter employed by that process, be of a nature which sets arbitrary limitations to self-development.

While the usual attitude has been that curriculum materials are restricted by the limitations of the capacities of the learners, the exact opposite is equally true. No matter how wide and expansive the total subject matter may be, the form of curriculum organization, and more especially the type of practice it inspires and the type of occupation on the part of the learner that it demands, can be definitely limiting to the development of the individual.

One of these restrictive factors is the tendency to deliver ready-made products of thought rather than to inspire a development of the processes by which such products are arrived at. The emphasis in the present type of curricula is definitely on the content values, rather than on the process values. The present curricula and their corresponding educational procedure are more concerned with the delivery of formulated truth than with the development of the methods and means of truth discovering. They give ready answers to stated problems instead of cultivating a problem-consciousness and challenging independent solutions. Generalizations are handed down, and so are the processes of reasoning by which one can work through the chaos of the concrete data to the clarity of the principle. And opinions implied or directly stated take the place of independent opinion forming.

The qualitative content of the experience evolving from learning is thus arbitrarily de-limited and pre-limited by the definite content set forth by the subject matter as prescribed by the curricula. The door of educational adventure for any particular individual is closed at the outset by imposing on him definite products of adult thought. Thus the experience of the learners is controlled by the influences in the contentual material delivered to them through instruction.

Apart from the question of the effects of compulsory mastery on the learner, it is apparent that the effects produced by the type of materials set forth for educational occupations are detrimental to the interests of the individual. The passive mastery of finished products of thought, in fact, drugs the creative and constructive abilities of the learner. It cannot be expected that minds, whose prime years of development have been spent in "learning" can exercise true intelligence in making wise adaptations to changing environments, still less effect any constructive reconstruction of that environment. Having acquired a habit to "learn" ready answers to ready problems, the individual finds himself unable to apply "an unprecedented attitude of mind to cope with the

unprecedented conditions and to utilize unprecedented knowledge." He tends to base his solutions on authority, on tradition, and deal with new matters in terms sanctioned by custom.

To stimulate the development of a creative attitude of mind it is necessary for educational material to be developed in the form of significant problems with their subject matter as experimental data for creative thinking in the solving of these problems. Curriculum materials should be regarded by teachers or learners only as materials to think with creatively, and not as ready-made products to be mastered and digested. And the curriculum itself, in whichever way it is conceived or formulated, should not represent a border-line of achievement, but a guiding-line for a process of self-discovery of important ideas, principles, and interpretations. Mastery would thus become a means for constructive thought and activity while assimilated knowledge and information would become tools for a fuller organization of inquiry and self-expression on progressively higher levels of experience.

It must not be forgotten that the period of formal education is but an initiation into the learning that is to follow throughout our lives, and, furthermore, that whatever we learn in school in the way of mastery will have to be re-interpreted and re-thought in dealing with the problems of actual life. Consequently, the best tool with which education can endow the growing individual is the method of dealing with new problems, a habit of utilizing all available knowledge in reasoning and forming judgments or in effecting solutions to problems whether in thought or conduct. Education has done its best when it has been able to sensitize the minds of learners to the variety of ways in which knowledge can be made productive, to the variety of methods for the treatment of facts, to the various interpretations events may be given; and, finally, when it has set the challenge for inquiry.

A limited and limiting lesson assignment, springing from the equally limiting "curriculum assignment" for the total period of education, proffers no challenge beyond

that of completing assigned tasks. It is not surprising, then, that the learning is considered completed when the task is mastered, or that, as it is customary to believe, education is at an end with the completion of a course in a high school or a college. It is also not surprising that the opinions either formed or "learned" in youth are tenaciously adhered to through later years against the compelling force of new situations and new facts.

A further restriction on the development of the experience of learners comes from the uniformity of subject matter and the identity of thought and learning processes to which all learners, irrespective of varying interests and capacities, are subjected.

Education guided and organized in terms of finished products of thought and concrete subject matter does not yield readily to an individualization of its materials or learning processes. In so far as the achievement of major educational objectives is identified with the mastery of certain specific fields of subject matter and certain specific processes of thought and action a uniformity of meanings, concepts, opinions and thought processes acquired through learning is unavoidable, as the uniformity is either directly required or strongly implied by the organization and presentation of such materials.

It is evident that there are elements in our racial heritage which in a certain true sense are of a uniform value to all, and therefore should be shared by all. There are also certain principles of thought, ways of feeling and of appreciation that are similarly essential to all types of experience. Thus, there are definitely certain common essentials more or less valuable to all learners, no matter what their interests or capacities.

But it should be equally evident that those common essentials are not of such a nature as to forbid the utilization of different processes, or of a variety of materials, for their achievement. It is quite feasible to realize those values which are common to all experience without subjecting the learners to an identical subject matter or to a strictly similar process of learning. It is, in fact,

in the proper conception of those common essentials that the cue to the individualization of educative experience without an utter disintegration of that experience is to be found.

At present the common essentials are conceived in terms of quantitative amounts of concrete subject matter. The mastery of definite fields, or of definite amounts of knowledge in various specific fields, is regarded as fundamental for education, and is therefore required of all learners. As it is impossible to overlook variations of capacity, provisions for such variations are made, but in a quantitative way, lesser amounts of subject matter being required of those of lesser ability, as the current provisions for minimum and maximum requirements clearly show. The qualitative differentiation of subject matter requirements, provided by the elective system, is limited to the so-called enrichment materials, and as such it does not touch the common essentials. The qualitative content of the subjects thought of as essentials is imposed on all learners in a uniform way, and practically no variation of the meanings, concepts, and interpretations, as well as of the thought processes, within the limits of those common essentials, is possible.

When the major objectives to be realized through occupation with subject matter are regarded in terms of experiencing, the common essentials can be seen in a different way. What, for instance, should be the common essentials in realizing the aim of a mathematical way of looking at the world ? What are the concepts, ideas, and thought processes that are essential for that purpose ? It is quite evident that these are not contained in any specific algebraic problems, nor in any specific segments of geometry, but in some fundamental concepts, meanings and thought processes, which, though they may be called mathematical, need not be limited to any contentual area of mathematics as a subject. It is quite conceivable that the objective of a mathematical way of looking at the world can be achieved by different individuals in quite different ways and through quite different subject matter.

The value of the achievement does not depend on the particular subject matter mastered, but on the way in which the occupation with it brings the individual to the adequate mathematical way of looking at the world. And this can be achieved in the most productive way when the individual has had the opportunity to use ways and means which most challenge his capacities and stimulate his thought and feelings.

To achieve a maximum utilization of the individual's capacities without neglecting such common essentials, it is necessary that education utilize the common guides for thought without restricting its specific processes. Those common guides for thought and activity can be found in the leading ideas, in organizing concepts, in principles of thought, and not in any specific and concrete segments of a subject matter.

Uniformity of education cannot be disposed of administratively because its roots lie in the type of qualitative content of experience fostered by learning, and in the similarity of the demands of a controlled experience, which in its turn produces a similarity of the thought processes by which the learners arrive at organized and articulated ideas, meanings, and knowledge. As far as the common guides for learning are contentual and specific, rather than functional and general, it is impossible to avoid a generation of similar ideas, similar opinions, and similar interpretations. And to the extent that this is done a maximum challenge of varying capacities and interests within a common unity of educative experiences is impossible. The problem must be tackled at its base. Individualization has to become the spirit of every concrete instance of educational procedure. Both subject matter and the process of education have to be so organized that within every specific task every student can apply his own method, can use different materials, and still be able to master or achieve what are regarded to be the common essentials in the objectives.

Only under such conditions can every learner work up to his maximum capacity and achieve the fullest measure

of a creative self-expression within the limits of common elements in all human experience.

III

Many of the misconceptions in current curriculum thinking spring from the nature of the methods and techniques used in the process of curriculum construction.

One of the practices leading to an arbitrary and artificial limitation of learning and of its subject matter is the segregation of the functions of curriculum planning and curriculum practice. Due to this division, problems such as the tasks students are to engage in, their sequence, the materials to be used, what students are to learn and what the outcomes of that learning are to be, are decided prior to, and apart from, the process of learning itself. Educational practice is thus deprived of any determining power in choosing and directing its own course, and consequently a vital factor is excluded from the process of curriculum making.

This segregation originated in a natural desire to guard education from incidental and ill-considered practices. Wider and sounder thought, deeper insight into the various fields of subject matter and into the educational principles involved than could be effected by any particular unit of practice or any one teacher is required for an adequate guidance of educational procedure. The task of appropriately selecting and directing educational activities demands co-operative effort by specialists in the various subject matters to be used as materials of learning, and by those experts possessing a wide perspective in educational thought and a thorough understanding of the specific educational principles involved. Any approach to the problem that does not enlist this co-operation is bound to throw over-emphasis either on subject matter or on educational procedures.

Unfortunately, this divided planning of the curriculum has resulted in the neglect of the constructive role that

actual practice can play in directing and re-directing these efforts, and especially of the limitations imposed on educational experiences forced to adopt a chart or scheme of activities which does not fully provide for the specific needs arising out of their particular structure.

At the time when an over-emphasis of academic subject matter was current, curriculum construction was left entirely in the hands of academicians, who, though well versed in their fields, had little knowledge of the educational principles necessary for a successful treatment of the subject matter of learning. It was natural, then, that the curricula formulated under such circumstances did not provide for genuine experience, nor was much heed given to the conditions under which such subject matter could be made educative for those who were to master it. While subject matter was organized around scientific principles beyond the understanding of the learners, it represented to these but a collection of strange symbols, with little genuine meaning.

This situation has been much improved. Curriculum construction has moved in its principles nearer to the learner and to the structure and needs of his experience. Teachers and other educational practitioners have been mobilized for the task of curriculum construction, and the domination of the academician has been replaced by the so-called curriculum specialist, who at least is in a position to take an educational viewpoint with regard to the organization and selection of subject matter.

But as to the co-ordination of practice and theory in curriculum building, the situation has changed but little. These two potentially constructive agencies are still separated in their function, and thus actual practice fails to contribute fully to the formation of the content of educational experience.

The curriculum cannot be regarded as a dead and summative body of all the materials, experiences and activities contained in the educational process. It is a living whole, comprised of experience actually going on in school. As such it is what it becomes in practice. Its

content is identical to the content of the actual experience of the learners.

Education being an evolving process, the sequences of its experiences and their contents are at least partly determined by the process itself. They cannot be fully seen or outlined in advance. So it follows that curriculum building cannot be completely segregated from educational practice without certain limiting effects on the curriculum and on education itself. To the extent that the nature of educational experiences and of their subject matter is progressively determined by the structure of the process itself, it cannot be prescribed prior to, or apart from, that process.

On the other hand—keeping in mind the conception of the curriculum given above—while everybody who is participating in the educational process contributes to the generation of ideas and meanings, to the reorganization and application of knowledge, they actually contribute to the building of the curriculum.

For the sake of the fruitfulness and the integrity of the educational process, it is important that whatever of value has emerged from its experiences at any stage should be consciously utilized in the guidance of the subsequent experiences. The learning that is to follow and the manner in which it is to follow should at least be partly determined by the experiences that have preceded, in order that the learning be continuous and fully educative. Consequently, the guidance of such a flowing and evolving process cannot be done quite adequately apart from and prior to, that process, however efficiently it may be done.

Thus curriculum planning is confronted with a dilemma. On the one hand it is quite evident that the entire guidance as to the selection of materials, as to the most fruitful and adequate educative enterprises, and as to the organization of both is a task requiring wide knowledge and insight into many fields of thought, and consequently cannot be left in the hands of those whose business it is to deal with the learners. On the other hand, any expert planning of the educational materials and processes outside of the

immediate practice is liable to cramp learning and limit the creative development of the educative experiences.

The solution should lie not in the choice of any one of these two alternatives, but in the successful co-ordination of the two, namely, in finding means by which practice may make use of expert thought and guidance yet would feel compelled to, and would be able to, use the products of such thought in a creative manner, and not be forced to yield to rigid prescriptions.

It is quite evident that the task of picking out the fundamentals from the multitude of values in our formulated as well as presently ongoing experience, of projecting the larger directives of education should be done by the co-operative thinking of those who are versed in general educational theory, and who master the specific fields of human knowledge and activities. It is their task to analyse the fundamental concepts, to point out major leading ideas, and to show the educative possibilities of certain regions of activities and experiences. And as far as it can be foreseen, knowledge of the effects of various educational processes in varying situations and in respect to different types of growing individuals should be available to those who are dealing with the guidance of educational practice.

But this general analysis is but one step in curriculum planning. These general principles, general directives, and general concepts are to be translated into, and evolved from, the concrete educational situations which vary from moment to moment and from individual to individual. In such dynamic guidance it is first necessary to have insight into what any particular situation may hold as to educative possibilities, and then to decide on the means and ways through which the values and objectives held as of uniform and compelling worth may be realized under those particular conditions. Thus a discovery and re-discovery of all the fundamental values is necessary to every concrete step in education, and one cannot relieve practice from the responsibility for curriculum construction.

Thus, while one can definitely see the necessity of some sort of planning in advance, based on a deeper insight into the educational principles and the nature of the race heritage and its educative possibilities, one cannot overlook the role of judgment and reasoning evoked on the spot, or the need for flexibility in the planning and organization of educational experiences. There is a definite need for a scheme of organization of educational activities which would be above the concrete incidentals of the practical processes. But it also is evident that to a large degree that scheme cannot be either complete or adequate or fully determined before the actual process is under way. The various steps of educational experiences cannot be charted in advance, because their educative value depends on evolving circumstances which cannot and should not be determined beforehand.

In this conflict between the predetermined and prescribed curriculum and the need of freedom and flexibility for the selection of the sequences of experiences and their subject matter according to changing and evolving needs of concrete and unique situations, a committee of the National Society for the Study of Education arrived at the following conclusion :

"In the process of teaching it is necessary that a teacher have at hand at any stage of his teaching an outline of the general attitudes, the finer appreciations, the important concepts and meanings, and the generalizations which he wishes to secure as part of the outcome of his instruction. . . Another way of stating the matter is that that part of the curriculum should be planned in advance which includes, (1) a statement of objectives, (2) a sequence of experiences shown by analysis to be reasonably uniform in value in achieving the objectives, (3) subject matter found to be reasonably uniform as the best means of engaging in the experiences, (4) statements of the immediate outcomes of achievements to be derived from the experiences."[1]

The acceptability of such a compromise depends largely on the form in which these products of planning are made

[1] *Twenty-sixth Yearbook*, pp. 19-20.

available to teachers, and in the manner and spirit in which they are used by them. While it is generally agreed that the statement of major objectives should come from wider considerations than any one single person can command, it is equally imperative that this statement of objectives should continuously incorporate whatever has been evolved in practice. And, on the other hand, in order that practice evolve results, principles, and directions which may be constructively useful to further curriculum thinking, it should not be closed to possibilities for evolving objectives other than those outlined for it, and perhaps equally valuable.

In the preceding discussion it was brought out that the general statements of objectives should be translated into forms of concrete experience that are ever unique and therefore different ; also that the concrete experience tends to evolve objectives not foreseen in the predetermined outline ; that, in fact, it quite rightly should do so. This implies that objectives stated in general terms undergo modification in the process of their realization, which means that from the practice evolve actual objectives of different qualitative content from those outlined, while a specific statement of objectives would inevitably lead to a rigid, uncreative, unproductive and uniform education.

There is a fundamental difference between major objectives devoid of any specific qualitative content, which serve only as a guide in dealing with the formation of specific qualitatively positive attitudes, ways of thinking, and modes of conduct, and those that definitely prescribe certain ways of behaviour, a certain content of learning, and certain processes of learning.

Thus, for instance, a democratic attitude of mind is an objective that in major lines gives some guidance to ways of behaving and thinking. Yet it does not limit the mind to any particular content of the concept democracy. Such particular contents are to be created in the educative process. On the other hand, an objective such as obeying the law, which is today considered one of the major and

most desirable of civic attitudes, expresses a positive content of certain attitudes; when it is included in some educative process it does not permit new thought to be applied to it; it not only shuts off other attitudes, but it also will not allow its own reconstruction. Consequently, if education is to be truly dynamic and liberating, the latter type of objectives, or the experiences that foster such objectives, should not have a place among the directives of educational experiences; while the former type, if considered not merely as an item of an outline but as a directive to creative thinking and experiencing in the development of educative situations, can serve as a real guide-line to educational thinking and to the selection of experiences and ways of creating those experiences.

Still more danger of an arbitrary limitation through the curriculum is involved in the proposal of the committee to outline those experiences and subject matter which are of a "reasonably" uniform value in achieving objectives. As no two experiences are exactly alike, so no two educational situations, when not artificially controlled, are exactly alike; nor do they hold uniform educative possibilities for every one participating. Consequently, any attempt to chart the educational situation and its experiences in advance will inevitably become inhibitive to the full educational utilization of the factors and possibilities evolving during the process of learning. Considering the unique course which the continuity of a genuine experience may take, and also considering the educative possibilities inherent in the freedom to follow that particular course, it is hardly conceivable how an advance outline of educational experiences can help education, except when made in terms furthering critical thought in the process of practice.

The ways and means through which any particular individual, or any particular group of learners, is to achieve those objectives which may be considered as of uniform value to all, must be suited to their particular needs and interests, if they are to be fully educative and fully contributive towards the achievement of those

objectives; and consequently no particular course of experiences can be considered as of uniform educative value unless this sequence and course is conceived in a very general sense. In this latter case, however, it would not be a sequence of educative experiences, but rather a general direction for selection and guidance of those experiences. During the course of an educative experience unforeseen possibilities of activities always emerge, and for the sake of the maximum development of the individual, as well as for the sake of the maximum educative effects of the activities undertaken, it is necessary that these possibilities be utilized in the further conduct of educational experiences. This means that the sequences of educative experiences be determined progressively as the process goes on and not beforehand.

The main characteristic of good educational guidance is the ability to make possibilities in widely diverging situations serve, as they come up, as the medium for education. Whereas in some cases a manual project will be quite helpful in fostering, for instance, co-operative attitudes, in some other cases the solution of algebraic problems may accomplish the same end. We must not forget that what an experience is able, or is not able, to foster does not depend on the kind of experience as viewed in isolation; it depends on the particular individual characteristics that this experience has when actually undergone in connection with other experiences.

There is but one way out of this dilemma in curriculum planning, and that is to relinquish the outline idea, the prescription idea.

Curriculum thinking should not attempt to provide exact charts for educational experiences, nor give any rigid prescriptions as to the materials to be used in connection with educational activities. Instead it should try to provide principles and materials to think with in a creative manner in dealing with educational practice. The value of curriculum planning does not so much lie in its ability to provide exact maps to be followed, as it does in furnishing those guiding the learning process with

a broad and critical outlook, sensitivity to possibilities that lie in each evolving situation, and ability to see the relations that the particular experience has with as many possible general principles and implications involved in every single experience.

Planning conceived of as a mapping out of experiences and particular objectives is conducive to a static education. What is desirable is planning in the sense of developing broad and thorough knowledge as to the way certain experiences foster certain outlooks, as to how certain bodies of facts grouped in a certain way will influence thought and conduct; as to what cues towards better and fuller experience can be found in the situation at hand. An outline of major objectives, major concepts, experiences, is very helpful, but it should not serve as an exact map, and it should not become a substitute for a living curriculum that is based on insight into the workings of the mind and the particular cues as to possibilities of growth that spring from the individual character of each experience.

There is no doubt that many practical difficulties are connected with this programme. In the first place, the whole basis of curriculum thinking has to be shifted from concrete materials and subject matter to the functional principles of thought, organizing concepts, and leading ideas. More emphasis is to be given to the methods of experiencing than to the finished and completed contents of experience. The practicability of this programme demands, too, a teacher with a preparation very different from the present training available, as well as greater co-operative thought between educational theory and practice, and continuous vigilance as to possibilities for the reconstruction of the curriculum in the process of its practice.

IV

At present efforts are not lacking to organize education around the vital experiences of learners, to throw off the yoke of dead subject matter, and to conduct educative

experiences in terms of the developing and growing individual.

Many of the so-called child-centred schools have broken away at least formally from the traditional curriculum, replacing it with units of work, with projects selected on the basis of the vital interests of children, and developed with the emphasis on the functional aspect of experiencing rather than in terms of the finished products of experience.

In these schools an effort is made to integrate curriculum building with curriculum practice, and to derive the curricula out of the coherence of developing experiences instead of following a predetermined continuity charted out by curricula outlined in advance.

As these practices are still new, it should not be expected that they have fully accomplished what they have set out to do. In the first place, there is as yet no general theory, and no generally adopted method, for the guidance of education in this form; nor has the reconstruction been thoroughgoing in any one particular unit of practice. In many if not most cases the educative experiences still follow in the main line the traditional subject matter, the units of work being introduced as a vitalizing element to break the monotony of mastery.

Even in those practices which have sincerely undertaken to organize education in terms of the creative reconstruction of experience there is often a definite lack of insight into the implications of this new position adopted, due to the lack of a sound theoretical basis. As a result, these practices as a whole are frequently incidental, and reveal the effects of misconceptions and inconsistencies, as well as a failure to free their processes entirely from the influences of the practices and the trends that they have in general rejected.

A great deal of the erroneous practice in the "child-centred" schools is due precisely to an over-emphasis on child-centredness, or, to be more exact, is due to a narrow conception of the experience of the child, out of which the educational activities are to grow. As the result of a strong reaction against the emphasis on subject matter

found in the traditional type of school, progressive education has regarded the child too much as a psychological phenomenon, failing to realize fully that the experience of the child is a product of its contact with the objective materials of its environment. Instead of subject matter alone doing it, the child only is now dictating educational procedure.

The interests and needs of children when regarded merely from a psychological standpoint are obviously not a sufficient basis for the selection and guidance of educational activities. They do not carry the patterns for their development within themselves. The interests and needs of the learners can at no moment of the educative experience be evaluated apart from the interests *in* and needs *of*. The reconstruction of experience, which this education is aiming at, is both functional and contentual at the same time, and the guidance of such experience in determining the course of education, has to consider both these aspects. Educative subject matter should so enter the experience of learners that it fully integrates with the ongoing experience; while at the same time this experience should be so directed that the more or less permanent values are incorporated.

In so far as the needs and interests of children, irrespective of their direction, are the sole determinants of educational procedure in child-centred schools, these rightly deserve some of the criticism that has been raised against them. The most valid of these objections is the charge that such schools follow incidental childish whims under the mistaken notion that they are following children's interests, and thus may be guided by those whims instead of guiding interests along channels leading to coherent knowledge, responsible utilization of the principles of thought, an intelligent treatment of data, and an appreciation of important values.

The experiences resulting from the undertakings prompted by the interests and needs of the learners should be progressively related through guiding ideas and concepts, and through these be knit together into an

organized unit. Single experiences motivated by accidental and immediate interests remain discrete and educationally unproductive if they are not used as a means for eliciting the fundamental relationships between ideas, events, and thought processes, if their development is not guided by some basic concepts that will serve as a common foundation for many concrete experiences and as unifying and directing factors. The immediate interests have to be made a vehicle for direct educational occupation, so that they may serve as tools for evolving fundamental relations between phenomena and events, for leading the experiential process into channels where the particular experiences are carried and directed by organizing ideas and principles.

Progressive education is in need of some guide-lines along which to organize the manifold educative activities so that consistent growth will more surely result from them. The familiar guide-lines of different subject matters are not only useless but often directly obstructive to an education the main concern of which is the fostering of the integrity of experience, and consistent yet flexible reasoning and judgment.

It is evident that the formulation of such guide-lines demands a reconsideration and reorganization of current educational values and of the ideas contained in the systematized groups of our race experience. This need has already been recognized and some steps have been taken toward an analysis of our race experience, of the ideas, beliefs and generalizations inherent in the present social and cultural structure with an aim to finding the most basic ones for fostering an intelligent, critical, and consistent outlook as well as a clear understanding of the forces operating in present day life and thought. Yet relatively little has been accomplished so far that is of real consequence in educative practice.

Another fact often overlooked by the proponents of the child-centred school and of the project method, is that by tearing down the structure of segregated subjects and by reorganizing educative experiences around the units of

work or centres of interests, learning is not necessarily made dynamic, in the sense that all that is learned becomes effective in the conduct of the learner and can be put to use in further learning. Education, organized around centres of interests can easily become a means for imparting static knowledge, by failing to make its enterprises vital enough or by failing to provide for experiences that are fully continuous and fully an outgrowth of preceding experiences.

This latter defect is very frequently present in practices in child-centred schools. At present, due to lack of research on this particular problem, there is very little understanding of how the familiar continuity of the subject-matter may be replaced by the continuity of enterprises so that a consistency in the generation of ideas, meanings, concepts, and other tools of thought and conduct will be achieved.

The sequences of units of work, and of the learnings resulting from the occupation with them, as practised at present, show that in the general guidance of educative experiences the principles of an integrated and well-rounded development of experience are not known or applied as fully as they could be. Standards for the choice and development of units of work are meagre and based mainly on the psychological consideration of the learners' immediate interests, inclinations, and habits.

In view of this, it is natural to find that those learnings having to do with habits, skills, and the development of some immediate interest, and which are those offering limited methods of work, are the ones planned for most consciously and adequately. The wider range of intellectual and social interests and abilities, and the means of securing intelligent thought in the larger problems of cultural and social life, are much less satisfactorily provided for, chiefly because it is not known what in these fields is basically important. Observation of progressive schools shows us that while educators know quite definitely how to promote, through a certain unit of work,

skills, habits, and some specific knowledge, they are at loss as to the wider intellectual and social implications involved in the activities and occupations at hand. This means, that while the concrete and immediate objectives, directly realizable through short-span activities, are guided quite consciously, those objectives which require longer continuities of activities, and which cannot be achieved directly, are left more or less to a chance development.

Wider interests, subtler and more general ideas, as well as more involved attitudes of mind and methods of thought, require a consistency in the type and content of educational activities, extending over longer periods of time. The present organization of the units of work throughout progressive schools shows little of such consistency and of an adequate cumulative and integrative growth of ideas and methods of thought and conduct. Units of work follow each other on the basis of what the learners incidentally happen to be interested in. They reveal little evidence of being directed in terms of cumulative, consistent growth, of being concerned with the learner's ability to handle problems, or even with the type of problem presented. They show an inadequacy of a basis for directed expansion, for a deepening of the methods of thought and a cumulative integration and organization of past experience. In fact, they often reveal a direct discontinuity from one grade to another; frequently even from one unit to another. They are not always selected and developed with a continuous upward trend in ways and contents of experience strictly in mind. And to the extent that this is not done, to that extent a full and consistent growth of the learning experience is impossible; to that extent learning remains incidental and wasteful; and to that extent, too, past experience cannot function to its full capacity as a helpful basis for a better organization of subsequent learning experience. Some learning always remains inert, some knowledge is always fragmentary and unutilized, and the total result quite fails to measure up to the potential possibilities.

Another factor which can be considered as instrumental in static and discontinuous learning is the tendency of progressive schools to lean too heavily on the concrete and descriptive in their choice of educative activities, and in their emphasis on the learning provided by these. Immediate enjoyment, factual information, and a widening of experience without its corresponding intensifying through inter-relations of meanings and ideas, are the chief outcomes resulting from this limitation of life-like situations to the concrete and descriptive type. Thought processes and learning activities are prevailingly guided by centres of interest such as historic epochs, geographic or racial areas, present-day institutions, and those of primitive life. Learning, as well as the processes of experiencing, is thus carried by concrete facts, or by groups of concrete facts, rather than by ideas and concepts, or by principles of interpretation of concrete facts and events.

Centres of activity like these, while not inherently limiting learning to the information and concepts inherent in them as factual units, nevertheless are not particularly conducive to the development of concepts and ideas possessed of greater power, nor are they directly conducive to the elicitation of those generalizations, relationships, and principles that enable thought to grasp more easily and more intelligently wider ranges of concrete facts of experience without being submerged in them. The concrete and existentially limited units are, of course, useful, as they provide a wide range of direct experience and enjoyment, and satisfy the natural curiosity to know more about things with which some acquaintanceship already exists. Under adequate guidance they also can be used to provoke good thinking and important generalizations and judgments. But as long as the grouping of learning activities is manifestly centred around the factual the learner's attention must also be focussed on the factual, and the result is concentration on the disintegrated, unrelated knowledge clinging to such units and failure to make any serious effort to elicit the more far-reaching and fundamental relationships of things, events, and ideas.

There are many binding concepts and relations absolutely fundamental for the intelligent understanding of the human being and his environment in the wider sense which, though they become actualized in different phenomena of life in individually different ways, are nevertheless common to many specific experiences. Projects or units of work should serve as a means for understanding, and at the same time for evolving, such general principles of understanding. They should not limit themselves to the factual and informational only, nor even to the immediate appreciations and understanding. They should endeavour to reach, through the specific, and by the immediate qualitative content of the specific, the general, and the fundamental.

This should by no means be taken as an advocacy of abstract knowledge or as a sponsorship of ideas disconnected from concrete actuality. The present revolt against abstract education is not, in fact, a revolt against abstract ideas as such, but against the method of acquiring or arriving at those ideas. An individual without the necessary basis or tools for abstract thought is at the mercy of a multitude of concrete experiences, unable to effect any control or mastery. Yet on the other hand, abstract ideas lose their potency, have in fact never come into existence, when they are not directly derived from, and again applied to, the concrete. They thus become senseless symbols, and as such are ineffective in actual experience. The aim of education, therefore, should be to make clear fundamental abstractions and generalizations through the medium of concrete experience, thus providing the individual with the necessary tools for integrating the concrete manifold by means of the generalities and for seeing and creating fundamental relationships between ideas and facts.

If progressive education were to make use of ideas and concepts together with the direct, concrete, descriptive and factual, units of work or centres of activity would not only offer a greater flexibility of ideas, a greater continuity of experience and school work, but would also provide a

very adequate basis for the consideration of individual differences, without isolating the groups following different interests. Thus, for instance, by taking the function idea as an organizing principle, the learning process can utilize all types of concrete enterprises from carpentry to the solution of algebraic problems, thus satisfying the differing individual needs and interests; it is able to provide concrete immediate experiences and at the same time have the school experience organized in such a way that the specific serves as a tool for forming the general principle. The specific facts, even groups of facts, stay static and isolated if some common organizing principle, some fundamental idea, does not tie them in a dynamic unity. A unity not based on the unity of the guiding idea but on the unity of concrete experience easily becomes uniformity.

The advantage of grouping projects around some leading idea rather than around some existential unit can be observed in still another aspect. Projects thus organized will not set any limit to the expansion or the intensity of any field or phase of experience. One can either travel through a wide range of materials and facts from different fields of knowledge, from different areas of human experience, or one can intensively deepen a limited field. In this way a maximum satisfaction of individual needs and a maximum realization of creative power can be achieved without splitting the school into different separate groups. Yet at the same time, the logic of phenomena and ideas will not be neglected.

Progressive education, by organizing learning around self-initiated and self-conducted activities called for by the immediate interests of the participants and by the experiential situations thus created, has marked a departure from the standards and principles of conducting learning that ruled traditional education. It has shown that important and educative learning can result from occupation with subject matter the sequence and organization of which are determined by evolving problems, and not academically. But this move can be regarded only as an initial step towards the educational reconstruction

aimed at by progressive practices. A difficult constructive task yet lies ahead—the task of evolving standards and principles necessary for guiding such self-conducted activities. A consistent intellectual organization of knowledge and integrity of experience cannot be achieved by incidental and haphazard practices lacking in continuity in purpose and result. Nor can it be expected that the mastery of the fundamentals of intelligent experiencing will result from a mere variety of incidentally chosen samplings of activities and subject matters. The educative experience, however flexible in its particular contents, has to be cumulatively continuous in its totality; and its single parts, in process as well as in content, have to be consistent with its evolving purpose and direction.

With regard to curriculum building and curriculum planning this means that though the particular contents of any particular evolving curriculum are determined by the continuity of experience in the corresponding unit of educational practice, on the whole certain fundamental principles of knowing and experiencing, as well as some basically important subject matters, should serve as guide-lines by which learning of a more permanent value and extensive application can be elicited from occupations of an immediate character. It is the task of progressive curriculum planning to extract from our heritage of knowledge, ideas, and thought, those elements that are fundamental in various types of experience and which can serve as consistent guides for learning without delimiting its results in advance.

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